IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

OMNIVISION TECHNOLOGIES, INC., Plaintiff, v. RE SECURED NETWORKS, LLC, Defendant.	C.A. No. 24-187-JLH-CJB **JURY TRIAL DEMANDED**

JOINT CLAIM CONSTRUCTION BRIEF

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TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

CASES

STATUTES

I. PRELIMINARY STATEMENT

A. RE Secured's Position

Patent holder RE Secured Networks, LLC ("RE Secured" or "Defendant"),[1] the Defendant and Counter-claim Plaintiff in this declaratory judgment action, proposes that each of the asserted patents, Patent Nos. 7,323,671 (the "'671 Patent"), 7,800,145 (the "'145 Patent"), 7,495,274 (the "'274 Patent"), and 6,838,651 (the "'651 Patent") (collectively, the "Patents-in-Suit" or "Asserted Patents"),[2] should be construed according to the plain and ordinary meaning of their language. RE Secured's proposed constructions are supported by the claims themselves, the specifications, the prosecution histories, testimony from Dr. Carley, a Carnegie Mellon professor who specializes in the same field of technology as the Asserted Patents, and by contemporaneous extrinsic evidence of how a person of ordinary skill in the art would understand these terms.

In contrast, declaratory-judgment Plaintiff OmniVision Technologies, Inc. ("OmniVision" or "Plaintiff"; collectively with RE Secured, the "Parties") has proposed constructions that are improperly narrow and in violation of multiple claim construction canons in an effort to manufacture an infringement defense where none exists. OmniVision also ignores established case law regarding standard claim language in an attempt to render readily understood claim terms indefinite, seeks to narrow terms by inserting language limiting claims to preferred embodiments, and inserts limitations to read out other disclosed embodiments. Those proposals should be

[1] A previous owner of the Patents-in-Suit, Pictos Technologies Inc. ("Pictos"), litigated many of these claim construction issues before the ITC in the action, *In re Certain Digital Imaging Devices and Products Containing the Same and Components Thereof*, Inv. No. 337-TA-1231 (the "1231 Matter"). That action settled prior to the ITC's Administrative Law Judge issuing a *Markman* order.

[2] The '671, '145, and '274 Patents are related and share similar specifications.

rejected, and RE Secured's proposals—which are consistent with the intrinsic record and the plain meaning of the claim terms—should be adopted by the Court.

B. OmniVision's Answering Position

OmniVision's constructions are consistent with the ordinary meaning informed by the specification and the file history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315–16 (Fed. Cir. 2005). On the other hand, RE Secured either solicits redrafting of the claims beyond their plain meaning or refuses to take a discernable position, instead defaulting to "plain and ordinary" without further explanation. *See Satius Holding, Inc. v. Samsung Elecs. Co., Ltd.,* 2024 WL 5090284, at *7 (D. Del. Dec. 12, 2004) (Burke, M.J.).

In February 2024, OmniVision filed suit in this Court seeking a declaratory judgment of non-infringement of U.S. Patent Nos. 7,323,671 ("the '671 patent") and 7,800,145 ("the '145 patent") in response to RE Secured seeking to exact a license fee from OmniVision based on threats of forthcoming litigation. (D.I. 1.) In its May 2024 Answer, RE Secured added an infringement counterclaim, asserting expired U.S. Patent No. 6,838,651 ("the '651 patent"). (D.I. 13.) Months later, in October 2024, RE Secured decided to amend its pleadings to add yet another patent, U.S. Patent No. 7,495,274 ("the '274 patent"). (D.I. 55.)

Despite its methodical addition of multiple patents to the present dispute and OmniVision's repeated attempts to meet and confer, RE Secured has been reluctant to engage in substantive discussions regarding disputed claim terms. For multiple disputed terms, OmniVision has been forced to attempt its best guess at RE Secured's position. For other terms, there appears to be a path forward through compromise, but RE Secured has been reluctant to move from its "plain and ordinary" designation for the term (even going so far as to refuse to acknowledge that "row and column circuitry" means "row circuitry" and "column circuitry").

OmniVision's constructions and assertions of indefiniteness are supported first and foremost by the intrinsic record, as cited herein. Its positions are further supported by the Expert Declaration of Dr. Albert Theuwissen (hereinafter "Theuwissen Op. Decl.", JA 627–88). Dr. Theuwissen is a designer, researcher, and instructor with over 40 years' experience in image sensor technology. OmniVision respectfully requests the Court's assistance in confirming the meaning of the disputed claim terms, and where there is no meaning with reasonable clarity, to find the relevant claims invalid due to indefiniteness.

C. RE Secured's Reply Position

As set forth in its opening brief, RE Secured has proposed claim constructions for the Patents-in-Suit that are grounded in the plain and ordinary meaning of the claim terms to those of skill in the art, as informed by the context of the intrinsic record, and should be adopted for that reason. OmniVision's proposed constructions—in contrast—improperly limit the claims to preferred embodiments, conflate independent and dependent claims, contravene established meanings in the art, and exclude disclosed embodiments from the intrinsic record. As discussed in detail below, OmniVision also relies on certain misinterpretations of the at-issue technology, which lead to claim interpretations that cannot be correct. OmniVision also alleges that three terms are indefinite, despite intrinsic record and expert testimony to the contrary. For two of these terms, OmniVision at best confuses breadth with definiteness. For the third, OmniVision has offered no argument at all, despite it being OmniVision's burden to show indefiniteness by clear and convincing evidence, and its constructions should accordingly be rejected.

Finally, for certain claim terms, OmniVision has complained that RE Secured did not provide proposed constructions. But, as the Federal Circuit has instructed, claim construction is not an obligatory exercise in redundancy. *See, e.g.*, *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). Simply because OmniVision would like to re-write

certain claims terms—presumably to manufacture non-infringement arguments—does not mean that those terms should in fact be re-written and redefined. Consistent with the Federal Circuit's guidance, RE Secured has explained why certain terms need not be construed and has also explained why OmniVision's proposals to re-write the claims are improper. Because RE Secured's claim construction positions are consistent with Federal Circuit caselaw, the intrinsic record, and extrinsic evidence, RE Secured respectfully requests that the Court adopt its proposals and reject OmniVision's overly-narrow and improper proposals.

D. OmniVision's Sur-Reply Position

OmniVision proposes claim constructions that are rooted in the plain meaning as understood by a skilled artisan in image sensor design, supported by reliable evidence, and consistent with claim construction principles. In contrast, RE Secured makes at least four overarching errors in its Opening and Reply Claim Construction Briefs, subverting the claim construction process.

First, RE Secured repeatedly fails to address the actual disputes raised by OmniVision, in favor of strawmen. This is particularly evident in RE Secured's failure to substantively respond to the indefiniteness problems of the "tending to," "background p-type concentration," and "non-constant work function" terms. Second, RE Secured misapplies laws of claim construction, including misinterpreting the parameters of a "plain and ordinary meaning." Third, RE Secured is unwilling to tether its arguments to any form of reliable evidence, whether intrinsic or extrinsic. Fourth, RE Secured uses its expert to rubber stamp its positions, instead of asking him to provide technical analysis, and what analysis he does provide is demonstrably incorrect.

This approach—misdirection, misapplication, a dearth of evidence and lack of reliable expert analysis—is at best unhelpful to the Court, and at worst a tactical technique to avoid resolving claim construction disputes. OmniVision thus respectfully requests that the Court adopt

its proposed claim constructions and disregard RE Secured's unhelpful and improper constructions.

II. TECHNOLOGY OVERVIEW

A. RE Secured's Opening Position

1. General Summary

The Asserted Patents generally relate to imaging sensors that are designed to be fabricated using complementary metal oxide semiconductor ("CMOS") technology and reflect specific advances resulting in higher quality images in both low and bright light, more efficient fabrication, and improved overall performance.

Solid-state image sensors include an array of light detecting elements known as photodetectors, which are interconnected to generate signals that represent the images received by the sensor. These photodetectors are usually formed into an array of rows and columns, each generating a signal proportional to the amount of light energy falling on the photodetector. The specific location of each photodetector in the sensor array is called a "pixel." As shown below in a schematic of a pixel (Fig. 1 of the '671 Patent), the pixel can include a pinned photodiode (PD) 210 as light sensing element, a transfer gate (TG) 220, a gloating diffusion 240, a MOSFET as reset transistor 230, a second MOSFET as source follower 260, and a third MOSFET as row select transistor 270. Each pixel provides an output signal corresponding to the intensity of the light energy falling upon its detecting area, which represents the level of light energy reflected from the respective part of objects in the detected image. This output is read and processed by processing circuitry to create an electrical representation of the image.

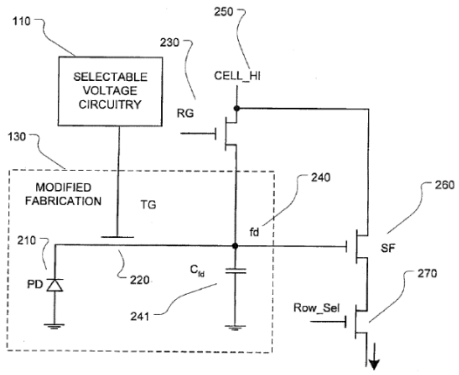


Fig. 1

'671 Pat. at Fig. 1, JA 6; '145 Pat. at Fig. 1, JA 48; '274 Pat. at Fig. 1, JA 90.[3]

CMOS technology has certain benefits over the older charge coupled device ("CCD") technology in areas such as lower power consumption, the ability to support higher data rates, and the ease of manufacturing. But traditional CMOS sensors suffered from certain drawbacks, such as lower picture quality or lack of uniformity across the pixels of the sensor. The Asserted Patents improved upon the prior art by disclosing CMOS technology that produced images with qualities on par with traditional CCD sensors.

2. Summary of the '671 Patent

Before the '671 Patent, CMOS sensors could generally only be created with a single set of preset parameters. This meant that transfer gates—a portion of the circuit that controlled transfer of electrons—could be fabricated with only one "on" voltage and one "off" voltage. Because of

[3] All citations to "JA __" are to the Joint Appendix filed as two volumes contemporaneously herewith. The volumes are organized as follows: Volume 1 (JA 1–579, including all intrinsic evidence filed with the Joint Claim Construction Chart (D.I. 78)—the four asserted patents and portions of each patent's file history); and Volume 2 (JA 580–1308, including each expert's opening and supplemental declaration, with exhibits, and three miscellaneous items cited by the Parties).

variations in the fabrication processes for those CMOS sensors, sensors designed before the '671 Patent resulted in a large number of defective sensors.

To overcome the limitations at the time, the '671 Patent discloses a device and computer readable instructions for creating a sensor that allows more robust designs allowing the transfer gate voltage to be adjusted. As a result of the invention disclosed in the '671 Patent, a greater number of operative sensors that work across a greater range of parameters can be made more efficiently.

3. Summary of the '145 Patent

The '145 Patent describes a device and method for an active pixel sensor that combines certain advantages of CCD image sensors—an older, more mature image sensor technology at the time the application was filed—with certain advantages of CMOS image sensors—the up-and-coming technology at the time and the primary image sensor technology today.

Before the '145 Patent invention, CMOS image sensors suffered from "dark noise," which occurred when little or no light hit the sensor and created undesired image artifacts. To solve this problem, the '145 Patent describes using p-type regions around photodiodes, control terminals, transfer gates, and reset devices to allow more efficient control of the flow of electrons in the rows and columns inherent in an image sensor.

The '145 Patent thereby allows creation of pixels that are more highly sensitive to light and less sensitive to dark "noise" at lower cost. The resulting invention thus allows high-sensitivity image sensors that allow images to be taken in low light and with high sensitivity.

4. Summary of the '274 Patent

Like the '671 and '145 Patents, the '274 Patent similarly discloses and claims improvements to CMOS image sensor technology.

The ’274 Patent describes a device and method for an active pixel sensor that combines certain advantages of CCD image sensors with certain advantages of CMOS image sensors. More specifically, the ’274 Patent describes that the “low noise advantages of a true correlated multiple sampling pixel (*e.g.*, Correlated Double Sample pixel) are created in a CMOS process with low cost and high performance with minimum impact on existing features and capabilities of the CMOS technology.” ’274 Pat. at 1:65-2:3, JA 119.

Further, when a photodetector is not cleared of all electrons between sequential images, there can be image lag, which causes signal loss for a current image and mixes the signals of the sequential images. To reduce this image lag, the ’274 Patent describes a graded transfer gate work function, which guides the electrons in the vicinity of the transfer gate in a direction from the photodetector area towards the transfer gate. *Id.* at 2:6-12, JA 119.

5. Summary of the ’651 Patent

The ’651 Patent is directed to a solid-state imaging device that converts a received image into signals that are indicative of that image. As shown below in Figure 1 of the ’651 Patent, a solid-state image sensor 100 includes an array of light detecting elements 102 known as photodetectors which are interconnected to generate analog signals that represent the images received by the sensor. These photodetectors are usually formed into an array of rows and columns, each generating a signal proportional to the amount of light energy falling on the photodetector. The specific location of each photodetector in the sensor array is called a “pixel.” Each pixel provides an output signal corresponding to the intensity of the light energy falling upon its detecting area, which represents the level of light energy reflected from the respective part of objects in the detected image. This output is read and processed by processing circuitry to create an electrical representation of the image. The ’651 Patent advances CMOS technology by combining multiple A/D converters in a single CMOS imager camera chip to attain very high

frame rates (and excellent noise reduction) and to process multiple colors using a lower number of A/D converters. Additionally, the '651 Patent achieves other desirable results such as lower power consumption and smaller footprint for the sensor.

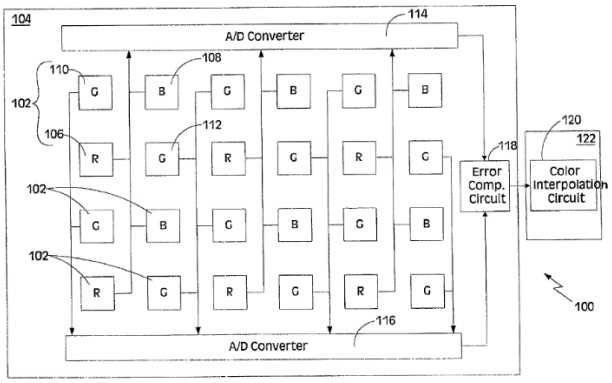


FIG. 1

'051 Pat. at Fig. 1, JA 132.

B. OmniVision's Answering Position

The '671, '145, and '274 patents ("Modified Transfer Transistor Patents ('MTTPs')") were all filed on December 30, 2004, and have identical figures and substantively identical disclosures. The MTTPs address purported improvement to active pixel CMOS image sensors. ('671 Pat. at 1:36-58, JA 35.) A CMOS image sensor is comprised of several components and layers including a crystalline photodiode region, transistors, metal interconnections, and other interlayers. (Theuwissen Op. Decl. at ¶ 42, JA 643.) A CMOS image sensor may contain millions of individual light sensitive units called pixels. (*Id.*, at ¶ 47, JA 645.) Each pixel is designed to absorb photons of light and convert them into an electrical signal. (*Id.*)

Figure 1 of the MTTPs discloses an exemplary 4T (four transistor) pixel with purported improvements in the addition of "selectable voltage circuitry" and a "modified fabrication" directed to the transfer transistor in the pixel, highlighted below.

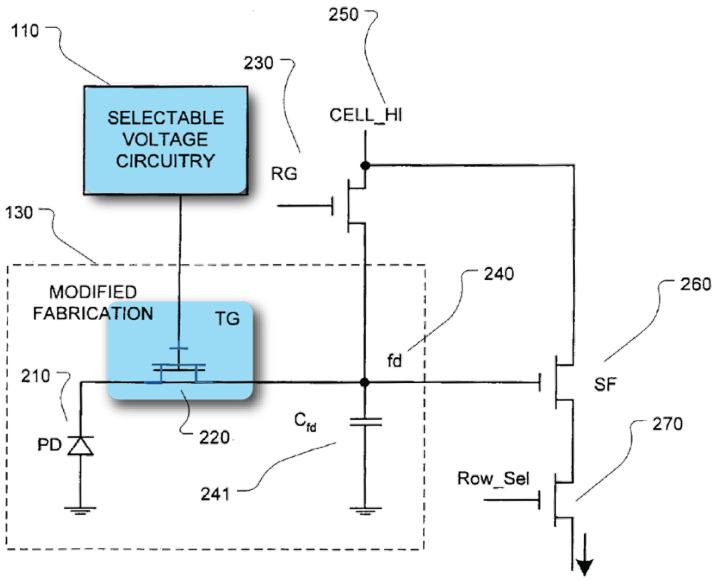


Fig. 1

('671 Pat. at Fig. 1 (annotated), JA 6.)

The '671 patent claims are directed to "variable voltage circuitry," which provides on-chip adjustment of the voltage applied to the gate of the transfer transistor. (Theuwissen Op. Decl. at ¶ 70, JA 653; '671 Pat. at 7:4-42, JA 38.) The '671 patent explains that the variable voltage circuitry provides "an adjustable voltage pulse . . . to the transfer gate in which the maximum applied voltage and the rise and fall times of the transfer gate voltage pulse can be adjusted." ('671 Pat. at 7:26-30, JA 38.)

The '145 and '274 patents are directed to the "modified fabrication" of aspects of the transfer transistor gate and surrounding areas. The gate of a transistor operates as a switch, controlling whether charge will be prevented or allowed to flow between the source and drain regions on either side of the gate. (Theuwissen Op. Decl. at ¶ 37, JA 641.) The '145 patent claims are directed purportedly solving the problem of "dark current," which is leakage current when the gate is "off." (*Id.* at ¶ 43, JA 644; '145 Pat. at 2:6-17, JA 77.) The claims recite certain "a plurality

of p-type regions having a concentration stronger than a background p-type concentration of the plurality of transfer devices" that supposedly will address the dark current issue. ('145 Pat. at 17:60–18:7, JA 85.) The '274 patent is directed to including a "non-constant work function" incorporated into the terminal of the transfer transistor gate.

The '651 patent is directed to the conversion of individual pixels, which are only capable of absorbing one of the following three colors: red, green, and blue. Thus, the measured value for any given pixel is only red, green or blue. The '651 patent discloses the ubiquitous Bayer filter arrangement in which the pixels are arranged in a pattern: green and blue pixels in one row, red and green pixels in the next row, and then the pattern repeats. ('651 Pat. at Fig 1, JA 132; Theuwissen Op. Decl. at ¶¶ 61–64, JA 650–51.) Each pixel measures only one color, but the outputted color value signal corresponding to each pixel requires color values for all three colors: red, green, and blue. Interpolation is the process by which the pixel is supplied with the two missing color values, which is accomplished by using estimated values based on other measured pixels.

The claims of the '651 patent address color interpolation by which two analog-to-digital converters are used: one for the two green pixels; the other for the red and blue pixels, and all four outputted digital signals are combined to create a three-color outputted value for each pixel.

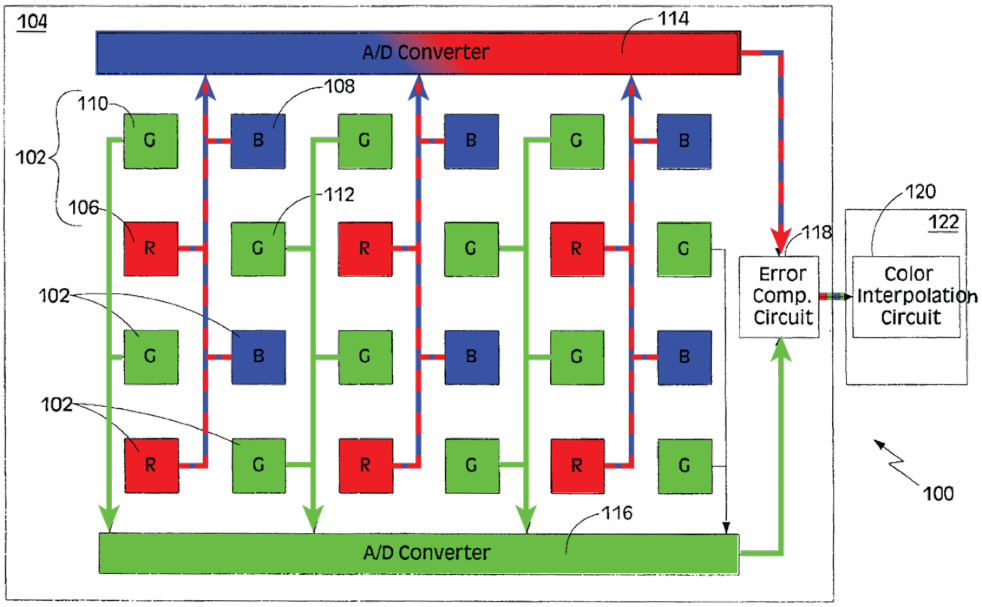


FIG. 1

('651 Pat., Fig. 1 (annotated), JA 132.)

C. RE Secured's Reply Position

RE Secured provided a brief overview of the Patents-in-Suit in its opening brief (RE Secured's Op. Br., *supra*, pp. 6-9) and intends to provide to the Court a technology tutorial to help further explain the technology at issue in this case and the patented inventions. Briefly, OmniVision's technological overview mischaracterizes the underlying technology, and the solutions claimed by the Patents-in-Suit, contributing to its misplaced proposed constructions. For example, OmniVision and its expert mischaracterizes the function of the charge transfer transistor, a significant component of the '671, '274, and '145 Patents, as a switch that controls whether charge will be prevented or allowed to flow between the source and drain regions on either side of the gate (OmniVision's Ans. Br., *supra*, pp. 9-11 (citing Theuwissen Op. Decl. ¶ 37, JA 641)). As discussed in more detail below, RE Secured's expert, Dr. Carley, explains that the job of the charge transfer transistor is to act as an analog amplifier that amplifies the voltage that is across

photodiodes and transfers image charge from the photodiodes onto the floating diffusion. OmniVision's description of the patents also suggests that the "variable voltage circuitry" requires an "on-chip" adjustment—it does not, including because not all components relating to an image sensor are on-chip. And OmniVision's argument that the '651 Patent requires each and every pixel in a device to be interpolated the same way is similarly inaccurate. These technological misunderstandings contribute to the impropriety of OmniVision's proposals—in addition to their violation of canons of claim construction—as discussed below.

D. OmniVision's Sur-Reply Position

RE Secured asserts that OmniVision's expert witness (who has over 40 years of experience in image sensor technology) and OmniVision (whose principal business is image sensors) somehow do not understand the technology at hand. (Reply Br., *supra* p. 13.) Notably absent from Dr. Carley's declaration about the "charge transfer transistor" operating as an amplifier is any citation to intrinsic or extrinsic evidence. (*Id.* at 12–13.; *see also* Supplemental Expert Declaration of Dr. L. Richard Carley (hereinafter "Carley Supp. Decl.", JA 689–713) at ¶ 41, JA 707–08.) RE Secured and Dr. Carley are flat wrong. (*See* Supplemental Declaration of Dr. Albert Theuwissen (hereinafter "Theuwissen Supp. Decl.", JA 714–37) at ¶¶ 30–36, JA 728–30.) RE Secured's Technology Overview is simply misdirection.

III. DISPUTED CONSTRUCTIONS

A. "an image sensor integrated circuit" ('671, '145, and '274 Patents)

Terms / Phrases	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
an image sensor integrated circuit	'671: 1 '145: 1 '274: 1	(Preamble is not limiting) An image sensor fabricated on an integrated circuit	(Preamble is limiting) An image sensor formed in a single integrated circuit

Terms / Phrases	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
A computer readable medium containing a description of an image sensor integrated circuit	'671:14	(Preamble is not limiting) A computer readable medium containing a description of an image sensor fabricated on an integrated circuit	(Preamble is limiting) A computer readable medium containing a description of an image sensor formed in a single integrated circuit
A computer readable description of an image sensor integrated circuit	'145: 12 '274: 11	(Preamble is not limiting) A computer readable medium containing a description of an image sensor fabricated on an integrated circuit	(Preamble is limiting) A computer readable medium containing a description of an image sensor formed in a single integrated circuit

1. RE Secured's Opening Position

The parties have two disputes regarding the preambles of claims 1 and 14 of the '671 Patent ('671 Pat. at 17:55 (cl. 1), 18:56-57 (cl. 14), JA 43), claims 1 and 12 of the '145 Patent ('145 Pat. at 17:36 (cl. 1), 18:48-49 (cl. 12), JA 85), and claims 1 and 11 of the '274 Patent ('274 Pat. at 17:36 (cl. 1), 18:53-54 (cl. 11), JA 127).[4] *First*, whether these preambles should be construed as limitations on the claims (OmniVision's position), or whether the preambles merely state the purposes or intended use of the invention (RE Secured's position). And *second*, if these preambles are found to limit the claims, whether they should be further construed to require that the claims be further limited to only a "single" integrated circuit (OmniVision's position), or if the plain meaning of the terms allows for the invention to be implemented using more than one chip (RE

[4] Both parties have agreed to group the preambles of claims 1 and 14 of the '671 Patent, claims 1 and 12 of the '145 Patent, and claims 1 and 11 of the '274 Patent together for the purpose of construing the term "an image sensor integrated circuit." *See* D.I. 78, Ex. A. Each of these claims mirror each other, except that claim 14 of the '671 Patent, claim 12 of the '145 Patent, and claim 11 of the '274 Patent recite "a computer readable [medium] description."

Secured's position). As discussed below, because the preambles should not be treated as limiting the claim scope and certainly should not be read to require the invention be implemented entirely on only one chip, RE Secured's construction is correct and should be adopted.

As to the first issue, the intrinsic record, including how the asserted claims are structured, confirms that these preambles are not limiting and that OmniVision's proposed interpretation is incorrect. As the Federal Circuit has held, "[p]reamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) (internal citations omitted). Here, the term "an image sensor integrated circuit" does exactly that—it merely states the purpose or intended use of the invention, *e.g.*, by identifying that the invention is an integrated circuit and that its intended use is to serve as an image sensor. *See, e.g.*, *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358-59 (Fed. Cir. 2010) (preamble term that "is simply a descriptive name for the invention that is fully set forth in the bodies of the claims" is not limiting).

As RE Secured's expert Dr. Carley explains in his expert declaration, a POSITA would have understood that claims 1 and 14 of the '671 Patent, claims 1 and 12 of the '145 Patent, and claims 1 and 11 of the '274 Patent each fully set forth the claimed inventions without the preamble and that the preamble does not provide any essential structure or necessary meaning to understand the claimed inventions. Carley Op. Decl. ¶ 52, JA 602-08.[5] For example, claims 1 and 14 of the '671 Patent recite all of the elements necessary for the invention, including "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a plurality of reset devices," "row and column circuitry," "a plurality of signal devices," and "variable voltage

[5] The Expert Declaration of Dr. L. Richard Carley in Support of RE Secured's Opening Claim Construction Brief (herein, the "Carley Op. Decl.") is included in the Joint Appendix at JA 583-626.

circuitry." '671 Pat. at 17:55-18:9 (cl. 1), 18:56-19:11 (cl. 14), JA 43-44; Carley Op. Decl. ¶ 52, JA 602-08. Claims 1 and 12 of the '145 Patent recite all of the elements necessary for the invention, including "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a first terminal," "a second terminal," "a body," "a control terminal," "a plurality of p-type regions," "a plurality of reset devices," "row and column circuitry," and "a plurality of signal devices." '145 Pat. at 17:36-18:13 (cl. 1), 18:48-20:12 (cl. 12), JA 85-86; Carley Op. Decl. ¶ 52, JA 602-08. Claims 1 and 11 of the '274 Patent recite all of the elements necessary for the invention, including "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a first terminal," "a second terminal," "a body," "a control terminal," "a plurality of reset devices," "row and column circuitry," and "a plurality of signal devices." '274 Pat. at 17:37-18:10 (cl. 1), 18:53-19:27 (cl. 11), JA 127-28; Carley Op. Decl. ¶ 52, JA 602-08. Given the disclosure of each claim, a POSITA would fully understand and be enabled to create the claimed invention in each of the patents without any need for the preamble. Therefore, as a matter of law, OmniVision's proposed construction to interpret the preambles as limiting should be rejected.

On the second issue, even if the preambles could be construed as limiting, OmniVision's proposed construction should be rejected as baseless and unsupported by the specifications of each of the '671, '145, and '274 Patents. There is nothing in the plain and ordinary meaning of "an image sensor integrated circuit" that requires that such a circuit be "formed in a ***single*** integrated circuit," as OmniVision alleges. Rather, as Dr. Carley explains, it would be apparent to a POSITA that, in the case of an image sensor integrated circuit where some features are analog and some are digital, those features can either be placed together on one chip or, to save costs, separately on an analog and a digital chip. Carley Op. Decl. ¶¶ 57-58, JA 609-10. Moreover, nothing in the claims as a whole restricts the scope of the claims to only embodiments formed in a single integrated

circuit. OmniVision's proposed construction reads into the preambles a limitation that the image sensor "consists of an array of pixels (rows x columns) with the associated active circuitry on the same chip" from the "Description of Related Art" disclosure in the specifications. D.I. 78, Ex. A, at 1-2; '671 Pat. at 1:35-39, JA 35; '145 Pat. at 1:36-40, JA 77; '274 Pat. at 1:36-40, JA 119. Any disclaimer or limiting definition in the specification must be clear and unambiguous. *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365-66 (Fed. Cir. 2012) ("To act as its own lexicographer, a patentee must *clearly* set forth a definition of the disputed claim term other than its plain and ordinary meaning") (internal citations omitted). Here, this one statement from the "Description of Related Art" does not clearly define the inventions as limited to a ***single*** chip. And, in fact, even if the statement were definitional (it is not), it still allows for circuitry, such as processing, to occur on a separate chip, as Dr. Carley explains, which is directly contrary to OmniVision's proposed construction. Carley Op. Decl. ¶¶ 58-59, JA 610.

Further, as Dr. Carley confirms, a POSITA, at the time of the filing of the '671, '145, and '274 Patent applications, would not have understood that the '671, '145, and '274 Patents require the entirety of the image sensor to be formed in a single integrated circuit "because integrated circuits designed for light sensing are more expensive per square millimeter than integrated circuits for general digital signal processing. Hence, it would be prohibitively expensive to use the image sensor process technology to implement all of the digital signal processing involved in the overall 'image sensor circuit.'" Carley Op. Decl. ¶ 58, JA 610. The claims here are thus infringed by any image sensor integrated circuit that encompasses all of the limitations in the body of the claims, whether formed on one chip or on multiple chips. Therefore, OmniVision's proposed construction should be rejected, and RE Secured's proposed construction should be adopted.

2. OmniVision's Answering Position

The Parties dispute: (i) whether the preambles are limiting and (ii) whether the term "integrated" should be read out of the claims. To avoid confusion, OmniVision includes "single" in its proposed construction, although the term is redundant since an integrated circuit is *necessarily* on a single chip. In the alternative, a ruling that the plain meaning of "integrated circuit" implicitly means *within a single semiconductor chip* accomplishes the same result. The parties agree that this dispute applies to all of the asserted claims of the MTTPs.

a. The preambles are limiting

Based on relevant caselaw and the text of the MTTPs, the preambles must be construed as limiting for at least two reasons. ***First***, the text of the preambles—specifically, "image sensor integrated circuit"—serves an antecedent basis for claim terms in each MTTP. ***Second***, the preambles provide a structural reference that defines what is and is not required to be a part of the physical device. In other words, the preamble recites an "essential structure." *See Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801 (Fed. Cir. 2002).

As to the first principle, it is well-established that when a claim term in the preamble is used for antecedent basis, the term is limiting. *See Integra Lifesciences Corp. v. HyperBranch Med. Tech., Inc.*, No. CV 15-819-LPS-CJB, 2018 WL 430177, at *1 (D. Del. Jan. 16, 2018), *report and recommendation adopted*, No. CV 15-819-LPS-CJB, 2018 WL 11190945 (D. Del. Mar. 9, 2018) ("A preamble may also be construed as limiting when the claim limitations in the body of claim 'rely upon and derive antecedent basis from the preamble[.]') (citing *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003)); *see also In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) ("We have repeatedly held a preamble limiting when it serves as antecedent basis for a term appearing in the body of a claim.") (also collecting cases); *RoboticVisionTech,*

Inc. v. ABB Inc., No. 22-CV-1257-GBW, 2024 WL 3183136, at *2 (D. Del. June 26, 2024) (finding that the preamble is limiting "because it is necessary to give 'life, meaning, and vitality' to the claims") (citing *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)); *Novartis Pharms. Corp. v. Accord Healthcare Inc.*, 387 F. Supp. 3d 429, 436 (D. Del. 2019); *Tech. Innovations, LLC v. Amazon.com, Inc.*, 35 F. Supp. 3d 613, 618–19 (D. Del. 2014).

"Image sensor integrated circuit" is not merely a phrase in the preamble of each MTTP, it also provides antecedent basis in each patent. In the '671 patent, for instance, claim 5 recites a "control signal" that is "generated on circuitry separate from ***the*** *image sensor integrated circuit*," and further recites that the "variable voltage circuitry" of claim 1 "comprises a digital to analog converter generating the control signal on ***the*** *image sensor integrated circuit*." ('671 Pat. at 18:18-23, JA 43.)[6] Claim 10 of the '671, claim 8 of the '145 patent, and claims 7 and 17 of the '274 patent all recite "a lifetime specification of ***the*** *image sensor integrated circuit*[.]" (*Id.* at 18:39-40, JA 43; '145 Pat. at 18:32-33, JA 85; '274 Pat. at 18:37-38, 20:19-20, JA 127–28.) These claims also recite "a ground voltage of ***the*** *image sensor integrated circuit*." ('671 Pat. at 18:39-45 (cl. 10), JA 43; '145 Pat. at 18:34-38 (cl. 8), JA 85; '274 Pat. at 18:37-43 (cl. 7), 20:17-25 (cl. 17), JA 127–28.) The claims rely on "image sensor integrated circuit" in the preamble as antecedent basis, and as such, the phrase must be limiting. *In re Fought*, 941 F.3d at 1178.

Second, "image sensor integrated circuit" does not merely state a purpose of intended use; it provides a structural reference for what is and is not physically required to be within a device to meet the scope of the claims. *Cf. Eli Lilly & Co. v. Teva Pharms. Int'l GmbH*, 8 F.4th 1331, 1340–41 (Fed. Cir. 2021) (explaining that a preamble describing the "intended use" or "purpose" of an invention is not limiting where the structure is fully claimed in the claims). Here, the preamble

[6] All emphases in OmniVision's sections are added unless otherwise noted.

does not simply lay out the invention's purpose; without the words of the preamble, the claims do not describe an invention that is structurally complete. For example, '671 patent claims 5 and 6 identify *components* that are located on the integrated circuit (claim 6) versus being separate from it (claim 5), thereby demonstrating the importance of the structural bounds provided by the "image sensor integrated circuit" limitation. ('671 Pat. at 18:18-23, JA 43.) Similarly, the MTTP specifications repeatedly reference particular claimed components as being "on the same chip," a phrase which would be meaningless if not for the preamble's reference to an integrated circuit. This indicates that the preamble term is limiting. *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952-53 (Fed. Cir. 2006) ("[B]ecause the preamble recites structural features of the [invention], it is apparent that the claim drafter chose to use both the preamble and the body of the claim to define the subject matter of the claimed invention.").

In other words, the preamble is limiting because it recites an "essential structure" for the claimed components. *See Catalina Mktg.*, 289 F.3d at 808. Here, "image sensor integrated circuit" sets forth the structure in which the photodiodes, nodes, terminals, reset devices, transfer devices, signal devices, and circuitry are located. (Theuwissen Op. Decl. at ¶ 96, JA 668.) These structural designations require that the preamble be limiting. *See Negotiated Data Sols., LLC v. Dell, Inc.*, 596 F. Supp. 2d 949, 982 (E.D. Tex. 2009); *Freescale Semiconductor Inc. v. ProMOS Techs. Inc.*, 561 F. Supp. 2d 732, 749 (E.D. Tex. 2008) ("integrated circuit" found limiting because it "describes the specific structure" in which claim was performed).

RE Secured's opening argument wholly ignores that antecedent basis and essential structure each independently establish that the preamble is limiting. RE Secured disregards the fact that multiple dependent claims in the MTTPs rely on the preamble language for antecedent basis and ignores the intrinsic evidence confirming that the preamble's "image sensor integrated circuit"

defines structural boundaries. Instead, RE Secured solicits extrinsic evidence in the form of a single paragraph by Dr. Carley in which he simply repeats the legal conclusion provided by counsel and wholesale copies the entire language of the asserted claims. (RE Secured's Opening Claim Construction Brief, D.I. 79 (hereinafter "Op. Br.") at *supra* pp. 15–16; *see also* Expert Declaration of Dr. L. Richard Carley in Support of Op. Br. (hereinafter "Carley Op. Decl.", JA 583–626) at ¶ 52, JA 602.) Dr. Carley's opinion on this matter should be disregarded, because it provides no analysis whatsoever.[7] *See, e.g., Bell Semiconductor LLC v. NXP B.V.*, 2024 WL 4984053, at *3 (Fed. Cir. Dec. 5, 2024) ("The Board accurately characterized NXP's expert testimony as conclusory and correctly pointed out that the only evidence in NXP's petition was a citation of their expert's declaration that parrots the language of the petition.") Furthermore, it is a bedrock principle of claim construction that extrinsic evidence cannot refute clear intrinsic evidence to the contrary. *Phillips*, 415 F.3d at 1317. RE Secured offers no persuasive argument grounded in the intrinsic record that the preambles of the MTTPs should not be limiting.

b. The term "integrated" cannot be read out of the claim

Given that the "image sensor integrated circuit" preamble language must be limiting, the dispute next turns to RE Secured's improper request that the Court cross out a word in the claim, making the preamble phrase instead read: "image sensor ~~integrated~~ circuit."

It is well-established that "integrated circuit" is a term of art in the field of electrical engineering, which means that the circuitry is formed on a single semiconductor chip. (Theuwissen Op. Decl. at ¶ 90, JA 665–66.) Indeed, multiple courts have interpreted "integrated circuit" in this manner. *See, e.g., Qualcomm Inc. v. Apple Inc.*, No. 17-cv-1375, Dkt. No. 404, at 3 (S.D. Cal.,

[7] Dr. Carley's conclusory opinion is also refuted substantively by Dr. Albert Theuwissen, an expert in image sensor technology with over 40 years of image sensor design experience. (Theuwissen Op. Decl. at ¶¶ 8–17, 20, JA 633–35, 636.)

Oct. 11, 2018), JA 1309 at JA 1312 (construing "integrated circuit" as "one or more circuit elements that are integrated ***onto a single semiconductor substrate***"); *see also Negotiated Data Ssols.,* 596 F. Supp. 2d at 979–82 (construing "integrated circuit" as "interconnected circuit elements disposed on a ***single substrate***").

The intrinsic evidence is consistent with the plain meaning as understood by the skilled artisan in the field of CMOS image sensors. The specification repeatedly confirms that "integrated circuit" refers to circuitry on a single semiconductor chip. Further, the specification makes clear that the alleged invention relates to "active pixel sensor[s] used in CMOS based imager arrays," which consist of "an array of pixels . . . with the associated active circuitry on the same chip." ('671 Pat. at 1:35-39, JA 35.) The "main advantage of using CMOS process," per the specification, is to save area and cost by placing both the pixel array ***and*** its associated circuitry "on the ***same chip***." (*See, e.g., id*. at 1:47-50, JA 35.) As further evidence that the use of a single chip in the image sensor is key to the alleged invention, the specification states that the alleged "process modifications" to traditional CMOS sensors are "in the pixel array and therefore the rest of ***the*** on-chip active circuitry need not be affected." (*Id.* at 4:21-27, JA 36.) Finally, the specific embodiments in the MTTPs make clear that the "image sensor integrated circuit" refers to a single chip. One such embodiment discloses an "on-***chip*** charge pump" for increasing transfer gate voltage, and another embodiment is directed to "blooming control during charge integration" with "on-***chip*** adaptive circuitry." (*Id.* at 14:64–15:1, JA 41–42.) The specification makes very clear that the "integrated circuit" in question necessarily refers to a single chip, which is an essential feature of the alleged invention.

RE Secured's analysis is premised on denying the well-established plain and ordinary meaning of "integrated circuit" and misdirecting the Court to inquire about evidence of disavowal

or lexicography. RE Secured's attempt to move the goalposts can be easily disregarded because RE Secured offers no plain and ordinary meaning of its own or any evidence in support as to such an alternative meaning. Absent some contradictory (presumably broader) plain meaning, RE Secured offers nothing to suggest that the specification employs a narrower (but not limiting) use of the term. The plain and ordinary meaning and the specification's use of "integrated circuit" are the same, and as such, there is no disavowal or lexicography issue to resolve.[8]

RE Secured's reliance on its expert opinion that a skilled artisan would consider separating analog and digital features onto separate chips is also flawed and unpersuasive. ***First***, the claims define the extent of the patent rights and provide critical public notice, not *post emissionem* expert opinion as to what else could have been claimed. *See, e.g., Phillips*, 415 F.3d at 1318 (explaining that courts will disregard unsupported expert testimony or expert opinions that contravene the claim language and other intrinsic evidence).

Second, the opinion is logically misguided. Whether a skilled artisan would have been aware of another structural arrangement does not address the scope of the claims as explicitly stated. Asserting that the claims should be construed based on what other alternatives ***could have been claimed*** mistreats the claims as the proverbial "nose of wax" and negates their statutory

[8] Even Dr. Carley's declaration supports the well-understood plain meaning, noting that an integrated circuit is "equivalently a semiconductor chip." (Carley Op. Decl. at ¶ 55, JA 609.) Although RE Secured asks him to expand the meaning in the next paragraph, Dr. Carley references a Wikipedia page relating to "***three-dimensional*** integrated circuit," a technology not at issue in this case. (*Id.* at ¶ 56, JA 609.) If Dr. Carley had instead pointed the Court to the relevant Wikipedia page addressing "integrated circuit," he would have reported that, "in strict usage, integrated circuit refers to the ***single-piece*** circuit construction originally known as a monolithic integrated circuit, which comprises a single piece of silicon." *See* WIKIPEDIA, *Integrated circuit*, https://en.wikipedia.org/wiki/Integrated_circuit. The "integrated circuit" Wikipedia page also cites to one article from 2009 stating, "nowadays when people say 'integrated circuit' they usually mean a monolithic IC, where the entire circuit is constructed in a single piece of silicon," and a second article from 1989 stating that the term relates to transistors and components that are "built from a single chip of semiconductor material." *Id.*

purpose pursuant to 35 U.S.C. § 112. *See Southwall Techs., Inc. v. Cardinal IG Co.,* 54 F.3d 1570, 1578 (Fed. Cir. 1995) ("a patentee may not proffer an interpretation for the purposes of litigation that would alter the indisputable public record consisting of the claims, the specification and the prosecution history, and treat the claims as a 'nose of wax.'")

Third, claims are interpreted as of the date of invention. *Phillips*, 415 F.3d at 1313. Neither RE Secured nor Dr. Carly offer any evidence directed to the understanding of skilled artisan as of 2004, the filing date for the MTTPs.

Fourth, the factual premise offered by Dr. Carley is flawed. Prior to 2012, there were no image sensors that were made using the "stacked" approach he suggests. (Theuwissen Op. Decl. at ¶ 95, JA 667–68.) Dr. Carley's opinion that a skilled artisan "would never have imagined putting the entirety of the functionality of an image sensor—both the analog and digital portions—on a single integrated circuit chip" suffers the foibles of memory. (Carley Op. Decl. at ¶ 58, JA 610.)

The claims recite "integrated circuit," which is a well-established term of art requiring that the components are on a single semiconductor chip. The intrinsic evidence uses the term in a consistent manner, indicating that the components are on a "single chip." ('671 Pat. at 1:35-39, 1:47-50, JA 35; *id.* at 4:21-27, JA 36; *id.* at 14:64–15:1, JA 41–42.) This is how the term would have been understood as of 2004 when the applications were filed. (Theuwissen Op. Decl. at ¶ 90, JA 665–66; *see also id.* at Exs. 9–12 (dictionary definitions of "integrated circuit"), JA 1167–96.)

3. RE Secured's Reply Position

OmniVision's assertion that the preambles are limiting and that the plain meaning of the term "integrated circuit" means "within a ***single*** semiconductor chip" is contrary to the intrinsic record and the underlying technology and reliant on a misinterpretation of the law regarding when a preamble is limiting. OmniVision argues that the term "image sensor integrated circuit" provides antecedent basis in each patent for ***certain dependent claims*** and that it provides a structural

reference without which the claims "do not describe an invention that is structurally complete." OmniVision's Ans. Br., *supra*, at pp. 20. In doing so, OmniVision tacitly admits that the independent claims—*i.e.*, those claims that are actually being construed—do ***not*** have any claim terms that rely on the preamble to provide antecedent basis. For the claims at issue, the preamble is not necessary to define the scope of the claim. The components recited in the body of the at-issue independent claims—which OmniVision overlooks—provide the essential structure and necessary meaning to understand the claimed inventions. As the Federal Circuit has held, "***when the claim body recites a structurally complete invention*** **and the** ***preamble language is used merely to state the purpose or intended use of the invention***, the preamble is generally not treated as limiting the scope of the claim." *Integra Lifesciences Corp.*, 2018 WL 430177, at *1 (quoting *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003)) (citing *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002)) (emphasis added); *see also Schumer v. Lab'y Comput. Sys., Inc.*, 308 F.3d 1304, 1310 (Fed. Cir. 2002) ("It is well settled that if the body of the claim sets out the complete invention, and the preamble is not necessary to give life, meaning and vitality to the claim, then the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation.") (internal quotations omitted); *Pitney Bowes*, 182 F.3d at 1305 (holding that "[i]f . . . the body of the claim fully and intrinsically sets forth the complete invention, including all of its limitations, and the preamble offers no distinct definition of any of the claimed invention's limitations, but rather merely states, for example, the purpose or intended use of the invention, then the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation").

As explained in RE Secured's opening brief, the term "image sensor integrated circuit" merely states the purpose or intended use of the innovation—it is not necessary to define a

structurally complete invention. *See, e.g.*, *Am. Med. Sys.*, 618 F.3d at 1358-59 (preamble term that "is simply a descriptive name for the invention that is fully set forth in the bodies of the claims" is not limiting). The bodies of the claims, in contrast, set forth the specific structure of the claimed invention, and they do so regardless of whether the preamble recited an "image sensor integrated circuit." For example, claims 1 and 14 of the '671 Patent recite "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a plurality of reset devices," "row and column circuitry," "a plurality of signal devices," and "variable voltage circuitry." '671 Pat. at 17:55-18:9 (cl. 1), 18:56-19:11 (cl. 14), JA 43-44; Carley Op. Decl. ¶ 52, JA 602-08. Claims 1 and 12 of the '145 Patent recite "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a first terminal," "a second terminal," "a body," "a control terminal," "a plurality of p-type regions," "a plurality of reset devices," "row and column circuitry," and "a plurality of signal devices." '145 Pat. at 17:36-18:13 (cl. 1), 18:48-20:12 (cl. 12), JA 85-86; Carley Op. Decl. ¶ 52, JA 602-08. Claims 1 and 11 of the '274 Patent recite "a plurality of photodetectors," "a plurality of nodes," "a plurality of transfer devices," "a first terminal," "a second terminal," "a body," "a control terminal," "a plurality of reset devices," "row and column circuitry," and "a plurality of signal devices." '274 Pat. at 17:37-18:10 (cl. 1), 18:53-19:27 (cl. 11), JA 127-28; Carley Op. Decl. ¶ 52, JA 602-08. These limitations—not the preamble—define the complete invention.

OmniVision relies on two Texas cases as alleged support (OmniVision's Ans. Position – Term 1, *supra*, pp. 21-23), but each is easily distinguished. In *Freescale Semiconductor, Inc. v. ProMOS Techs., Inc.*, the court found that "integrated circuit" was relied upon during prosecution by the patentee to distinguish prior art "on the basis that a prior art patent is not implemented on a single integrated circuit but that [t]he claimed invention . . . is implemented on an integrated

circuit." 561 F. Supp. 2d 732, 749 (E.D. Tex. 2008). Thus, the court concluded that the "patentee…relied on the preamble to define, in part, the claimed invention, and the preamble of [the at-issue claim] is a claim limitation." *Id.* ***No such reliance on the preambles exists during prosecution here***. Similarly, in *Negotiated Data Sols., LLC v. Dell, Inc.*, the court found that the patentee used the term "integrated circuit" throughout the specification and used the term to describe the preferred embodiment of the at-issue patent. 596 F. Supp. 2d 949, 982 (E.D. Tex. 2009). Thus, the court concluded that the term "discloses a fundamental characteristic of the claimed invention" and that the patentee "uses the term to provide structure, rather than to merely show some intended use or purpose." *Id.* In contrast, here, the term "integrated circuit" is only found once in the specifications, demonstrating that it is ***not*** a "fundamental characteristic" and instead merely used to state a purpose or intended use of the claimed inventions.

Moreover, OmniVision's proposed construction additionally reads into the claims the term "single," which is nowhere to be found in the claims or specifications. *See, e.g.*, Claims 1 and 14 of the '671 Patent (17:55-18:9 (cl. 1), 18:56-19:11 (cl. 14), JA 43-44; Claims 1 and 12 of the '145 Patent (17:36-18:13 (cl. 1), 18:48-20:12 (cl. 12), JA 85-86); Claims 1 and 11 of the '274 Patent (17:37-18:10 (cl. 1), 18:53-19:27 (cl. 11), JA 127-28). This further confirms the impropriety of OmniVision's proposal.

As alleged support for its narrowed construction, OmniVision has not identified any alleged disclaimer either in the specifications or in the file histories. Instead, OmniVision cites to a few passages from one of the specifications that at most describe certain embodiments, but certainly do not define or limit any claim terms. *See, e.g.*, OmniVision's Ans. Br., *supra*, pp. 19-21 (where OmniVision cites as alleged support disclosures such as that the "specification repeatedly confirms that 'integrated circuit' refers to circuitry on a single semiconductor chip" and

that "[a]s further evidence that the use of a single chip in the image sensor is key to the alleged invention, the specification states that the alleged 'process modifications' to traditional CMOS sensors are in the pixel array and therefore the rest of ***the*** on-chip active circuitry need not be affected") (OmniVision's emphasis). It is axiomatic that features of such embodiments—even if preferred—should not be read into the claims that do not recite them.

Contrary to OmniVision's assertion, nothing in the specification "makes very clear that the 'integrated circuit' in question ***necessarily*** refers to a single chip." OmniVision's Ans. Br., *supra*, p. 23 (emphasis added); *see Thorner*, 669 F.3d at 1365-66 ("To act as its own lexicographer, a patentee must *clearly* set forth a definition of the disputed claim term other than its plain and ordinary meaning") (internal citations omitted). The specification does not preclude that certain components relating to an image sensor, such as processing circuitry, can occur on a separate chip. The specification merely describes that "[a]nother main advantage of using CMOS process is to have the pixel array with the associated active circuitry on the same chip and save area and cost" (*see, e.g.*, '671 Pat. at 1:47-50, JA 35)—this disclosure does not state that *all* components relating to an image sensor need to be on the same chip, just that the pixel array with associated active circuitry can be on the same chip. Similarly, the specification describes that certain embodiments specifically include an on-chip charge pump and an on-chip adaptive circuitry (*see, e.g.*, '145 Pat. at 14:53-57, JA 83; *id.* at 14:48-50)—again, this disclosure does not mean that *all* components relating to an image sensor are on-chip. Therefore, the claim terms should not be read to require that the invention be implemented entirely on a single semiconductor chip, which is unsupported by the claims or specifications.

Further, Dr. Carley provides in his expert opinion that a "POSITA would have been aware of image sensor technology that existed since at least the 1990s where the image acquisition

systems carried out some portion of the image processing on additional integrated circuits, *e.g.*, for analog conversion and signal processing." Carley Suppl. Decl. ¶ 26, JA 703.[9] And Dr. Carley has identified additional sources of extrinsic evidence confirming his understanding is correct. Carley Suppl. Decl. ¶ 24, JA 703 (citing Exs. P-R, JA 864-886). This understanding of a person of skill in the art further confirms the impropriety of OmniVision's proposed construction.

Finally, even if "an integrated circuit" were found to be limiting and the term "integrated circuit" were construed to mean "single chip," the plain language of the claims still allows for the invention to be implemented by "one or more chips." *See, e.g.*, *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (stating that "[t]his court has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising'") (quoting *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000)). An exception to the rule that "a" can mean one or more arises only "where the language of the claims themselves, the specification, or the prosecution history necessitate a departure from the rule." *Id.* at 1342-43 (internal citations omitted). Here, the at-issue claims are comprising claims. And, as described above, the specifications contemplate and allow for implementations of the inventions that are not confined to a single chip. Therefore, the exception to the rule does not apply and, under Federal Circuit precedent, because nothing in the specification expressly requires the invention to be implemented entirely on one chip, "an" integrated circuit may be properly construed as one or more integrated circuits.

[9] The Supplemental Expert Declaration of Dr. L Richard Carley in Support of RE Secured's Reply Claim Construction Brief (herein, the "Carley Suppl. Decl.") is included in the Joint Appendix at JA 689-713.

4. OmniVision's Sur-Reply Position

The disputes here are (1) whether the preambles are limiting, and (2) whether the word "integrated" can be read out of the claim language.

(1) The preambles are limiting. RE Secured is not able to contest the case law that establishes that a preamble is limiting where it is relied upon for antecedent basis. (Ans. Br., *supra* pp. 18–19.) Instead, RE Secured makes much hay—without any citation to case law—over the fact that it only asserted independent claims and argues that the dependent claims therefore can be ignored when evaluating whether the preambles are limiting. (Reply Br., *supra* pp. 24–25.) RE Secured is wrong. It is black letter law that ***all*** claims are relevant when analyzing claim construction—whether those terms are asserted ***or not***. *See, e.g., Vitronics Corp. v. Conceptronic, Inc*., 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("[W]e look to the words of the claims themselves, ***both asserted and nonasserted***, to define the scope of the patented invention."); *3Shape A/S v. Align Tech., Inc.*, 2020 WL 2188857, at *1 (D. Del. May 6, 2020) (Hall, J.) *R. & R. adopted*, 2020 WL 7695898 (D. Del. Dec. 28, 2020) ("Considering other, ***unasserted***, claims can also be helpful."); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (same). RE Secured effectively concedes that the preambles are limiting. (*See* Ans. Br., *supra* pp. 20–21.)

RE Secured also repeats its Opening Brief position that "image sensor integrated circuit" is not limiting because it instead states the "purpose" or "intended use" of the invention. This is irrelevant given that antecedent basis already establishes that the preamble is limiting. Nonetheless, neither RE Secured nor its expert has done anything more than point to a series of structural elements in the claim. (*See* Reply Br., *supra* pp. 26–27.) There is no analysis to support RE Secured's contention. Similarly, OmniVision previously put forth two binding cases explaining that a preamble ***is*** limiting and does ***not*** merely state an intended purpose or use where the claims do not describe a structurally complete invention unless one looks to the preamble for

guidance. (Ans. Br., *supra* p. 19–20 (citing *Eli Lilly & Co. v. Teva Pharms. Int'l GmbH*, 8 F.4th 1331 (Fed. Cir. 2021) and *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945 (Fed. Cir. 2006).) RE Secured does not address these cases or OmniVision's arguments. Having not disputed OmniVision's argument and evidence that a preamble that is necessary for a structurally complete invention must be limiting, RE Secured should be further deemed to have conceded that the preambles at issue are limiting. *See, e.g., Bench Walk Lighting LLC v. LG Innotek Co.*, 530 F. Supp. 3d 468, 477–78 (D. Del. 2021) (holding that plaintiff conceded an argument that defendants raised in brief but to which plaintiff did not respond).

(2) "Integrated" has meaning. The use of the word "integrated" confirms that the relevant components are on a single chip. As a preliminary matter, RE Secured's arguments regarding lexicography and disclaimer are irrelevant. (Reply Br., *supra* p. 16–17.) OmniVision never raised these points, as OmniVision's proposed constructions rely on the plain and ordinary meaning.

OmniVision's position is that the specification makes clear that the "integrated circuit must refer to a single chip." (Ans. Br., *supra* pp. 22–23.) OmniVision presented (i) disclosures from the specifications and (ii) dictionary definitions from the relevant time period to demonstrate that the alleged invention clearly contemplates that the claimed image sensors are on a single chip. (*Id.*; *see also* Theuwissen Op. Decl. at ¶¶ 90–91 (citing dictionaries), JA 665–67.) In response, RE Secured provides zero alternative dictionary definitions, and instead points to its expert's opinion that a POSITA would know of technology "where the image acquisition systems carried out some portion of the image processing on additional integrated circuits." (Reply Br., *supra* pp. 28–29 (citing Carley Supp. Decl. at ¶ 26, JA 703–04).) Not only is it unclear why RE Secured is addressing an "image acquisition system," but Dr. Carley provides no support for this assertion

whatsoever. The only credible evidence, put forth by OmniVision, establishes that the image sensors must be on one chip.[10]

RE Secured puts forth a last misguided argument that even if the Court construed "an integrated circuit" as a "single chip," "the plain language of the claims still allows for the invention to be implemented by 'one or more chips'" due to the word "comprising." (Reply Br., *supra* p. 29.) RE Secured misunderstands or misapplies the law and OmniVision's position. Just because an integrated circuit "comprises" all the listed elements, does not mean there cannot be ***additional*** functionalities (such as those beyond image sensing), which could occur off chip. But that does not do away with the limiting preamble, which requires that the ***image sensor*** is within a single chip.

RE Secured fights arguments OmniVision never raised and fails to address the arguments and evidence that OmniVision ***did*** raise. RE Secured's proposals as to the preambles should be disregarded.

B. "coupling the plurality of nodes to the row and column circuitry" ('671, '145, and '274 Patents)

Term	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction

[10] RE Secured does not address the preceding paragraph in Dr. Carley's new declaration, in which he attempts to reverse course from his first declaration. (Carley Supp. Decl. at ¶ 25, JA 702.) Dr. Carley originally stated that "[a] POSITA would never have imagined putting the entirety of the functionality of an image sensor…on a single integrated circuit chip," which Dr. Theuwissen disproved. (Carley Op. Decl. at ¶ 58, JA 610; Theuwissen Op. Decl. at ¶¶ 90–91, JA 665–67.) Now, Dr. Carley does an about face and agrees that during the relevant timeframe, image sensors ***were*** fabricated on single chips. Dr. Carley's opinions on this subject, therefore, should be disregarded. *See, e.g., Aea v. Sec'y of Dep't of Health & Hum. Servs.*, 6 F.3d 787, *1 (Fed. Cir. 1993) (declining to reverse where expert "testimony was rejected because it was ***internally inconsistent***, speculative in nature, [and] ***contradicted by an earlier report*** written by [the same expert]"); *see also BearBox LLC v. Lancium LLC*, 125 F.4th 1101, 1115 (Fed. Cir. 2025) (affirming striking supplemental report as offering new opinions, especially where the opinions contradicted expert's testimony).

coupling the plurality of nodes to the row and column circuitry	'671: 1, 14 '145: 1, 12 '274: 1, 11	Needs no construction	Plain and ordinary meaning, which requires coupling the plurality of nodes to row circuitry and column circuitry, not row or column circuitry

1. RE Secured's Opening Position

The dispute here is whether this claim term would be readily understood by a POSITA such that no construction is necessary (RE Secured's position), or whether the term "row and column circuitry" should be re-written to be "row circuitry" and "column circuitry" (OmniVision's proposal) such that the plurality of nodes has to be coupled to both row circuitry and separate column circuitry. As Dr. Carley explains, a POSITA would understand, in view of the specifications of the '671, '145, and '274 Patents, that the term "row and column circuitry" is referring to circuitry for row and column decoders, not that it requires both row circuitry and separate column circuitry, nor separate coupling to each. Carley Op. Decl. ¶¶ 62-64, JA 611-12. Specifically, the specifications of the '671, '145, and '274 Patents each describe that the "circuit also includes row and column circuitry such as row and column decoders." '671 Pat. at 2:20-21, JA 35; '145 Pat. at 2:31-33, JA 77; '274 Pat. at 2:26-27, JA 119; *see also* Carley Op. Decl. ¶ 63, JA 611-12.

OmniVision's proposed construction improperly reads in terms not required by the claim language, particularly "row circuitry and column circuitry." Carley Op. Decl. ¶ 63, JA 611-12. The term "row circuitry and column circuitry" cannot be found anywhere in the specifications of the '671, '145, and '274 Patents. Moreover, it is unclear what OmniVision means by "not row or column circuitry." As Dr. Carley states in his expert opinion, OmniVision's proposed construction obscures the meaning of the term "row and column circuitry," which is plainly described in the

specifications of each of the '671, '145, and '274 Patents as circuitry such as "row and column decoders." *Id.* This term does not need to be construed and should not be construed in a way that improperly rewrites the claim to something narrower and different from what the inventor actually invented. *See, e.g.*, *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998) ("The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.").

As Dr. Carley concludes, a POSITA would not have needed a construction for this term. Therefore, OmniVision's proposed construction should be rejected, and RE Secured's proposed construction should be adopted.

2. OmniVision's Answering Position

All of the asserted claims of the MTTPs include the claim language "a plurality of signal devices coupling the plurality of nodes to the row and column circuitry." RE Secured has not been forthright as to its position on this claim term, but OmniVision understands RE Secured's position to be that "row ***and*** column circuitry" should be read as "row ***or*** column circuitry." The claim means what it says: the plurality of nodes must be coupled to the row ***and*** column circuitry. The issue here is one of logic, dependent on syntax; the claim term requires "coupling" of the "nodes to [i] the row [circuitry] ***and*** [ii] column circuitry." Coupling to just one of the row and column circuitry does not satisfy the claim language. The plain meaning requires both.

a. OmniVision's construction is consistent with the specification and well-established meaning of row and column circuitry

The signal devices (transistors) "coupling the plurality of nodes coupled to the row and column circuitry" means that there are a plurality of instances in which a node is coupled to both

the row and column circuitry [by the signal devices]. RE Secured seemingly seeks to redraft the claim to eliminate this explicit requirement.

OmniVision's position is confirmed by well-established understanding of "row and column circuitry" in a CMOS image sensor and the intrinsic evidence. Row and column circuitry perform different functions. (Theuwissen Op. Decl. at ¶¶ 103–05, JA 670–71.) The rows of pixels in the pixel array are processed serially. (*Id.* at ¶ 103, JA 670.) The row circuitry determines which row of pixels is connected to the column circuitry at any given time during image processing. The row circuitry operates upstream of the column circuitry; it determines when a pixel will be connected to the column circuitry. The column circuitry receives the output from the pixel circuitry. (*Id.* at ¶ 104, JA 670.)

The MTTPs do not show any row or column circuitry in the figures, and the only discussion of row and column circuitry is a passing reference to "row and column decoders." (*See, e.g.,* '671 Pat. at Figs. 1 and 2, JA 6–7.) Nonetheless, the intrinsic evidence's discussion of the pixel circuitry confirms that the row circuitry is distinct from the column circuitry. (*See, e.g.,* '274 Pat. at 4:9-22, JA 120; *see also id.* at 6:1-4, JA 121; *id.* at 15:53-59, JA 126 (describing the "row select transistor"); *id.* at Figs. 1 and 2, JA 90–92 (depicting the row select transistor, or "Row_Sel" as **270**).) With respect to Figures 1 and 2 of the MTTPs, the row circuitry determines the value of the input to the "Row_Sel" gate for Row Select Transistor 270 for each pixel, which operates as a switch: when the voltage goes high, the pixels in that row are connected to the column circuitry; when it is low that row is not connected. The row select transistor provides a connection point for the row and column circuitry. Dependent claims 8 and 18 of the '274 patent, 11 and 24 of the '671 patent, and 9 of the '145 patent reflect this arrangement, reciting the use of row select transistors to couple the row and column circuitry. ('274 Pat. at 18:45-46 (cl. 8) and 20:27-28 (cl. 18), JA

127–28; '671 Pat. at 18:47-48 (cl. 11) and 20:20-21 (cl. 24), JA 43–44; '145 Pat. at 18:40-41 (cl. 9), JA 85.)

The claim means what it says: the plurality of nodes must be coupled to the row ***and*** column circuitry. The plain meaning requires coupling to both and the intrinsic evidence confirms that this is the correct interpretation.

b. RE Secured proposes no construction, but does not show how OmniVision's proposal is *not* the plain and ordinary meaning

RE Secured fails to offer any explanation as to what is supposedly encompassed under its interpretation. Its rejection of "row and column circuitry" as meaning "row circuitry" and "column circuitry," along with an oxymoronic "separate coupling" position add confusion.[11] Indeed, RE Secured 's expert witness's position that row and column circuitry means "row and column decoders"—based only on examples from the specification—would seemingly narrow the claims while confirming the need for two distinct items (both row decoders ***and*** column decoders). (Carley Op. Decl. at ¶ 63, JA 611–12.)

To suggest that the "row and column circuitry" only requires coupling to a single circuitry unit, as RE Secured does, requires a reading against this plain and ordinary meaning as understood by a skilled artisan, the intrinsic evidence, and even the testimony of RE Secured's own expert

[11] RE Secured's infringement contentions also do not provide any hint as to what RE Secured contends is encompassed by the claim language. RE Secured wholly omits the first part of the disputed claim language, failing to discuss any "nodes" that are coupled for any asserted claim, and instead merely identifies a row select transistor gate for two patents, and block diagram reference to row and column circuitry for the third. (*See* Defendant's Preliminary Infringement Contentions, Oct. 4, 2024 (hereinafter "RESN Infr. Cont.", JA 1230–44) at Appendix A ('671 Pat.) at 9, 15, JA 1234, 1238; *id.* at Appendix B ('145 Pat.) at 16–17, JA 1240–41; *id.* at Appendix D ('274 Pat.) at 9, 16, JA 1243–44.)

witness. Nowhere does the patentee explicitly define "row and column circuitry" to mean "row circuitry or column circuitry." Without a specific indication by the patentee to the contrary, the plain and ordinary meaning must prevail. *See Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365–67 (Fed. Cir. 2012).

RE Secured cannot redraft the claims to remove claim language: *e.g.*, "coupling the plurality of nodes to the ~~row and~~ column circuitry." Absent any intrinsic evidence to suggest that the patentee intended to claim something other than what was written, "the claim means what it says." *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372 (Fed. Cir. 2004); *Satius*, 2024 WL 5090284, at *7 ("courts simply cannot 'redraft claims'; claim terms are understood to mean what they say, even if that meaning does not seem very practical (or even if sometimes it appears nonsensical).").

3. RE Secured's Reply Position

OmniVision's proposed construction of this term is overly narrow, is in direct contradiction with the specification, and appears to be an attempt to manufacture a non-infringement position by re-writing the term in a way that is contrary to how it would be understood by a POSITA.

The broader claim term is "a plurality of signal devices coupling the plurality of nodes to the row and column circuitry." As described in its answering brief, OmniVision would require each node to be directly connected to row circuitry and each node to also to be directly connected to column circuitry. This is contrary to the plain language of the claim, would read out the embodiments disclosed in the specification and, as confirmed by Dr. Carley, is not how the term would be interpreted by a POSITA.

As an initial matter, and as RE Secured described in its opening brief, there need not necessarily be entirely separate row and column circuitry. Dr. Carley explains, as confirmed by the intrinsic evidence, that a POSITA would not understand the meaning of the claim term "row

and column circuitry" in such a restrictive way. Carley Op. Decl. ¶¶ 62-64, JA 611-12. To support its construction, OmniVision refers to the discussion of a "row select transistor" in the specifications and Figs. 1 and 2 of the patents as evidence that "confirms that the row circuitry is distinct from the column circuitry." Ans. Br., *supra*, pp. 35. But the specifications do not expressly require this distinction either in the figures OmniVision identifies or anywhere else. Instead, the specifications' only mention of the term "row and column circuitry" is with respect to "row and column decoders." '671 Pat. at 2:20-21, JA 35; '145 Pat. at 2:31-33, JA 77; '274 Pat. at 2:26-27, JA 119. OmniVision's citations to the dependent claims of the patents also fare no better—while the dependent claims make mention of "row select transistors coupled to the row and column circuitry," none of the dependent claims use the phrase "row circuitry and column circuitry" as OmniVision contends. Ans. Br., *supra*, pp. 35-37; '274 Pat. at 18:45-46 (cl. 8), JA 127; *id.* at 20:27-28 (cl. 18), JA 128; '671 Pat. at 18:47-48 (cl. 11), JA 43; *id.* at 20:20-21 (cl. 24), JA 44; '145 Pat. at 18:40-41 (cl. 9), JA 85. Rather, the specifications and claims consistently refer to "row and column circuitry" as a singular term.

Regardless, even if the claims did require entirely separate and distinct row circuitry and column circuitry, OmniVision's construction is too narrow because it also appears to require each and every single node to be separately (and directly) coupled to the row and column circuitry. First, to the extent that OmniVision's position is that "coupling" means a direct electrical connection to row and column circuitry, its position is contrary to the specifications and how a POSITA would understand the term. As Dr. Carley confirms, in Figs. 1 and 35 of the '671 Patent, the horizontal line attached to the gate of the select transistor (labeled as Row_Sel) is a row line, which is a portion of the row circuitry, and the horizontal line attached to the gate of the charge transfer transistor (labeled as tg#) is also a row line, which is a portion of the row circuitry. The

node is buffered by a common drain transistor and connected by a switch to a column line (the downward pointing arrow), which is part of the column circuitry. Carley Suppl. Decl. ¶ 32, JA 705. It thus would be clear to a POSITA from Fig. 1 combined with Fig. 35 of the '671 Patent that the plurality of nodes, the floating diffusions, required by the at-issue claims, are coupled to the row and column circuitry. *Id.* Further, Dr. Carley explains that, as confirmed in embodiments of the specifications, a floating diffusion (the node) is not necessarily directly connected to either the row or column circuitry. The row line (a part of the row circuitry) is coupled to the floating diffusion through the gate of the charge transfer transistor, and the column circuitry is coupled to the floating diffusion through the common-drain transistor and the Row Select switch transistor. *Id.* ¶ 33, JA 705-06. A POSITA would not understand this limitation to require that each and every node be directly and separately coupled to the row circuitry and also to the column circuitry. *Id.* ¶ 34, JA 706. Further, the term "coupling" does not necessarily require a direct electrical connection but, as confirmed by the specifications, coupling can be through one or more transistors. *Id.* ¶ 35, JA 706. Thus, as Dr. Carley concludes, OmniVision's proposed construction is not the plain and ordinary meaning and is contrary to the intrinsic record.

OmniVision's position has also been rejected by courts. *See, e.g.*, *Bradford Co. v. Conteyor N. Am., Inc.*, 603 F.3d 1262, 1270 (Fed. Cir. 2010) (holding that "coupled to" "should be construed broadly so as to allow an indirect attachment"); *ICM Controls Corp. v. Honeywell Int'l, Inc.*, 256 F. Supp. 3d 173, 202 (N.D.N.Y. 2017) (holding that the term "coupled" permits an indirect connection). And, similarly, OmniVision appears to be requiring a separate coupling to each node

(Ans. Br., *supra*, pp. 35-36), but the claim does not read like this. Instead, the claim is broader and requires that a "plurality of nodes" are coupled to the row and column circuitry.[12]

The Federal Circuit has explained that "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *See Renishaw PLC*, 158 F.3d at 1250. And claims should not be read contrary to the specification and in a way that would read out the embodiments. *Phillips*, 415 F.3d at 1315 ("[C]laims must be read in view of the specification, of which they are a part. . . . the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.") (internal citations and quotations omitted). Therefore, the Court should reject OmniVision's proposed construction of plain and ordinary meaning, which is an attempt to re-write the claims to prevent them reading on image sensors that embody what the inventors of the patents actually invented.

4. OmniVision's Sur-Reply Position

It remains uncontroverted that a skilled artisan would understand that the plain and ordinary meaning of "row and column circuitry" connotes two items: row circuitry and column circuitry. (Ans. Br., *supra* pp. 35–36; *see also* Theuwissen Op. Decl. at ¶¶ 97, 99, JA 669.) RE Secured's Reply does not address the issue at all. Nonetheless, its reliance on Dr. Carley's discussion of the truncated portions of connecting lines that serve only to connect the row and column circuitry as being "part of the row and column circuitry" unwittingly confirms that "row and column circuitry" are separate items with separate locations to which a connection could be made. (Carley Supp.

[12] OmniVision's attempt to redraft the term "plurality of nodes" to "a node" has also long been rejected by the Federal Circuit. *See, e.g.*, *Dayco Prods., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1327-28 (Fed. Cir. 2001) ("[W]e have held that plurality, when used in a claim, refers to two or more items, absent some indication to the contrary.") (internal quotations omitted).

Decl. at ¶ 33, JA 705–06; Theuwissen Supp. Decl. at ¶¶ 18–21, JA 723–25.) By virtue of his ability to identify two different locations—one for row circuitry, then the other two for column circuitry—Dr. Carley concedes the point: the plain and ordinary meaning of the "coupling the plurality of nodes to the row and column circuitry" is that there are two circuitries coupled to the "plurality of nodes": (1) row circuitry; and (2) column circuitry. (Carley Supp. Decl. at ¶ 33, JA 705–06.)

RE Secured resorts to three pages of strawman arguments concerning "directly" coupling and "entirely separate row and column circuitry," ignoring the issue before the Court: the meaning of "row and column circuitry." OmniVision has not asserted the coupling must be "direct."

The issue before the Court is "row and column circuitry" and RE Secured offers no evidence whatsoever to treat the plain and ordinary meaning as being row circuitry or column circuitry, or some other amorphous structure. Dr. Carley is unable to offer any contradictory meaning for "row and column circuitry" or how those items are used in an image sensor. The Court should adopt the plain meaning of "row and column circuitry," which is row circuitry and column circuitry.

C. "variable voltage circuitry" ('671 Patent)

Term	Claims	RE Secured's Proposed Construction	Construction OmniVision's Proposed Construction
variable voltage circuitry	'671: 1, 14	Plain and ordinary meaning, *i.e.*, circuitry in which the voltage can be adjusted	Plain and ordinary meaning, which is circuitry that provides adjustable analog voltage levels for the control signal

1. RE Secured's Opening Position

RE Secured's proposed construction that the term "variable voltage circuitry" be construed as its plain and ordinary meaning, *i.e.*, circuitry in which the voltage can be adjusted, should be adopted by this Court. In contrast, OmniVision's proposed construction that the term "variable

voltage circuitry" be given the meaning "circuitry that provides adjustable analog voltage levels for the control signal" should be rejected as unduly narrow.[13]

Whereas RE Secured's construction naturally aligns with the claim language, OmniVision's construction does not. In particular, in contrast to the claim language of the '671 Patent, OmniVision's proposed construction of variable voltage circuitry to require "adjustable analog voltage levels for the control signal" incorrectly reads terms into the claim language, *i.e.*, "analog voltage levels." Carley Op. Decl. ¶ 67, JA 613. There are no "analog voltage levels" mentioned in any of the claims of the '671 Patent.

Further, RE Secured's construction is consistent with the specification and OmniVision's proposed construction is not. For example, the specification of the '671 Patent describes that "[i]n our innovation, an ***adjustable voltage*** pulse is provided to the transfer gate in which the maximum applied voltage and the rise and fall times of the transfer gate voltage pulse can be adjusted." '671 Pat. at 7:26-30, JA 38 (emphasis added); *see also* Carley Op. Decl. ¶ 67, JA 613. OmniVision's construction is inconsistent with this disclosure in the '671 Patent specification. As Dr. Carley explains, the '671 Patent specification describes that "[i]n our innovation adjustable voltages of increased absolute potential are also provided for the gate of the reset transistor. This

[13] In the ITC 1231 Matter, Pictos, the patent holder at the time, proposed the construction "A circuit for generating a control signal that switches between two voltages, at least one of which can be adjusted, and which is applied to the plurality of transfer devices" for the full term "variable voltage circuitry [including a voltage selector determining a control voltage of the control signal applied to the plurality of transfer devices]." While that construction is generally consistent with RE Secured's construction, the claim term identified for construction in this proceeding is shorter—it is just "variable voltage circuitry." 1231 Matter, Updated Joint Proposed Claim Construction Chart dated Apr. 9, 2021 (Carley Op. Decl., Ex. M, JA 835-37). For this shorter claim term, RE Secured has proposed a construction consistent with how the ITC Commission Investigative Staff proposed the term to be construed in the 1231 Matter. *See* Carley Op. Decl. ¶ 66 n. 21, JA 612. The Staff attorney chose to construe the shorter phrase "variable voltage circuitry," which is what is at issue here, and not the longer term.

ensures that the sense node potential can be reset to the power supply voltage of the chip to ensure maximum pixel capacity." '671 Pat. at 11:63-67, JA 40; *see also* Carley Op. Decl. ¶ 67, JA 613. Moreover, the specification provides that:

> Blooming Control during charge integration: **Because the transfer gate's voltage is variable**, it can be used for blooming control during charge integration. If there is excessively bright light, there will be excess charge in the PD. This excess charge should rather be drained to the floating diffusion node of the same pixel rather than causing blooming to occur in the neighboring pixels. If the light level is so high that there will be blooming in the adjacent pixels, the TG voltage should be lowered, to enable the excess charge to flow to the floating diffusion node easily. This **voltage is variable and can be adjusted** to the desired level by the on-chip active circuitry. (FIG. 5)

'671 Pat. at 14:50-63, JA 41 (emphases added).

Thus, OmniVision's attempt to read claim terms into the claim language that are unsupported by the specification should be rejected. Instead, as Dr. Carley concludes, a POSITA at the time the '671 Patent application was filed would understand this term based on its plain and ordinary meaning, in view of the specification, or as restated by RE Secured: "circuitry in which the voltage can be adjusted." Carley Op. Decl. ¶ 68, JA 613. Therefore, OmniVision's proposed construction should be rejected, and RE Secured's proposed construction should be adopted.

2. OmniVision's Answering Position

RE Secured seemingly concedes OmniVision's position, yet still refuses to adopt OmniVision's construction. Both parties agree that "variable voltage circuitry" is directed to an adjustable voltage control signal that is applied to the transfer devices. (Op. Br., *supra* p. 42; *id.* at 42 n.16.) OmniVision further agrees with RE Secured's description that the purported advancement of the '671 patent is to allow the "voltage for the transfer gate [to] be varied," whereas as conventional image sensor designs "work only with a single set of predetermined parameters." (*Id.*, *supra* pp. 6–7.) Moreover, RE Secured's own expert witness has opined that

the relevant portion of the image sensor here, the pixel, operates on analog signals. (*See, e.g.,* Carley Op. Decl. at ¶¶ 42, 67, JA 599, 613.) Yet the dispute somehow remains.

Based on OmniVision's understanding of RE Secured's position,[14] the dispute is whether RE Secured seeks to read this clause as somehow encompassing the image sensor that would simply set different predetermined voltages. "Analog" confirms that the variance does not entail a "high" voltage to turn on the transistor, "low" voltage to keep it off, or some other preset level. RE Secured seemingly walks away from the predecessor owner's prior construction which would seek to encompass conventional turning on and off of a transfer gate via predetermined levels, but at the same time contends that it is "generally consistent" with its current interpretation. (*See* Op. Br., *supra* p. 42; *id.* at 42 n.16).

RE Secured's infringement contentions make no mention of any ability to vary the voltage of the transfer gate—focusing instead on a purely generic, functional block diagram with a box directed to conventional control logic—and thus provide no guidance. (*See* RESN Infr. Cont. at Appendix A at 12, JA 1236.) Nonetheless, to the extent that RE Secured is not seeking to encompass predetermined levels in the definition of "variable voltage circuitry," there should be no substantive dispute.

To the extent that RE Secured disagrees, RE Secured is improperly seeking to redraft claims to cover what was never intended. It was well-understood prior to 2004 that the control voltage of the transfer gate could be varied and that general variation is not same as changing between pre-determined levels, such as a high signal to close the transfer "switch" and a low signal

[14] OmniVision repeatedly attempted to obtain RE Secured's position on this issue through various meet and confer requests, but RE Secured would not respond substantively. (*See, e.g.,* Email from K. Lynch to A. Sewanan (Apr. 11, 2025), JA 1225–26.)

to keep it open. (*See* Theuwissen Op. Decl. at ¶ 109, JA 672 (discussing Ex. 13 to Theuwissen Op. Decl. (U.S. Patent No. 6,002,123), JA 1197).)

The '671 patent further makes it clear that it is attempting to resolve the problems of imperfect manufacturing, by essentially providing a voltage dial so that changes could be made on the fly during operation. ('671 Pat. at 2:5-11, JA 35; *see also* Theuwissen Op. Decl. at ¶¶ 70–71, 108, JA 653–55, JA 672.) As opposed to predetermined states, the "variable" means that there is not a consistent pattern and that is subject to change. ('671 Pat. at 14:61-63, JA 41 ("This voltage is variable and can be adjusted to the ***desired*** level by the on-chip adaptive circuitry.").) Moreover, this analog nature of the signal (*i.e.* not limited to set levels as digital high and low logic) is confirmed by dependent claims 6, 7, and 8, which all address different particular aspects of a changing analog waveform. (*Id.* at 18:21-29, JA 43; Theuwissen Op. Decl. at ¶ 110, JA 672–73.) There is no suggestion anywhere in the claim that variable voltage circuitry is merely conventional switching in values, and such an interpretation would convert Figures 1 and 2 to the admitted prior art. (Theuwissen Op. Decl. at ¶ 109, JA 672.)

To the extent that RE Secured agrees that it is not seeking to encompass predetermined voltage levels (as it concedes is not the claimed invention), there should be no dispute. Variable voltage circuitry is circuitry that provides adjustable analog voltage levels for the control signal, per its plain and ordinary meaning.

3. RE Secured's Reply Position

The term "variable voltage circuitry" in image sensor technology is well known to a POSITA. As explained by Dr. Carley, the function of a "variable voltage circuitry" of a CMOS transistor, as described in the specification of the '671 Patent, is to act as an analog amplifier that amplifies the voltage across photodiodes and transfers image charge from the photodiodes onto the floating diffusions, *e.g.*, function as an analog amplifier that turns on when the tg line is high

and that turns off when the tg line is low, as shown in Fig. 11 of the '671 Patent. Carley Suppl. Decl. ¶ 41, JA 707-08. In addition, as Dr. Carley explains, in order to optimize the performance of the photodetection and readout circuit, the patent discloses that the value of V_{high_tg} may be adjusted. *Id.* The "variable voltage circuitry" turns off when the pulse signal is low. And when the pulse is high, Dr. Carley explains that the "variable voltage circuitry" can have multiple set voltage levels. *Id.* OmniVision's proposed construction of the term "variable voltage circuitry" is thus premised on this misunderstanding of the image sensor technology described in the '671 Patent and should be rejected by this Court. OmniVision bases its proposed construction on a confused understanding of the technology, stating that the "analog nature of the signal" means "not limited to set levels as digital high and low logic." Ans. Br., *supra*, p. 45. OmniVision thus seeks to exclude "predetermined levels" from its proposed construction. However, as Dr. Carley confirms, analog does not preclude having multiple set voltage levels, *e.g.*, at a "high" voltage when the pulse is on. *See* Carley Suppl. Decl. ¶ 41, JA 707-08.

Further, RE Secured's construction is consistent with the specification, which describes that "[i]n our innovation an ***adjustable voltage*** pulse is provided to the transfer gate in which the maximum applied voltage and the rise and fall times of the transfer gate voltage pulse can be adjusted." '671 Pat. at 7:26-30, JA 38 (emphasis added). Moreover, the specification provides that:

> ***Because the transfer gate's voltage is variable***, it can be used for blooming control during charge integration. If there is excessively bright light, there will be excess charge in the PD. This excess charge should rather be drained to the floating diffusion node of the same pixel rather than causing blooming to occur in the neighboring pixels. If the light level is so high that there will be blooming in the adjacent pixels, the TG voltage should be lowered, to enable the excess charge to flow to the floating diffusion node easily. This ***voltage is variable and can be adjusted*** to the desired level by the on-chip adaptive circuitry. (FIG. 5)

'671 Pat. at 14:50-63, JA 41 (emphases added). RE Secured's proposal captures this "variable" nature.

OmniVision criticizes RE Secured's proposed construction as somehow "walk[ing] away from the predecessor owner's prior construction." Ans. Br., *supra*, p. 44. But as RE Secured stated in its opening brief, its proposed construction is consistent with Pictos' construction in the ITC 1231 Matter. That matter involved the construction of a longer phrase not at issue here ("variable voltage circuitry [including a voltage selector determining a control voltage of the control signal applied to the plurality of transfer devices]"). For this shorter claim term at issue ***here***, RE Secured's proposed construction is consistent with how the ITC Commission Investigative Staff construed the "variable voltage circuitry" portion of the larger term at issue ***there***. *See* Carley Op. Decl. ¶ 66 n.21, JA 612.

4. OmniVision's Sur-Reply Position

After the parties had both agreed that "variable voltage circuitry" does not encompass "predetermined levels," RE Secured now seems to encompass exactly what it first told the Court was the prior art deficiency—not the "adjustable" voltage that the patent specification is directed to. (*Compare* Op. Br., *supra* p. 6 ("***Before the '671 Patent***, CMOS sensors could generally only be created with a single set of ***preset*** parameters.") *with* Reply Br., *supra* p. 46 (critiquing OmniVision's proposal for "seek[ing] to exclude 'predetermined levels,'" and noting that Dr. Carley opines "analog does not preclude having multiple set voltage levels").)

The specification makes clear that there is a modified arrangement to include the variable voltage circuitry. ('671 Pat., Figs. 1 and 2, JA 6–7).) OmniVision agreed with RE Secured that "predetermined voltage levels" are not within the scope of "variable voltage circuitry." (Ans. Br., *supra* p. 44.) Neither RE Secured nor Dr. Carley contests that allowing this phrase to encompass pre-determined levels would serve to ***read out*** "variable voltage circuitry" entirely from the claim,

as confirmed by Dr. Theuwissen. (*See* Theuwissen Op. Decl. at ¶ 109, JA 672.) should be no dispute here.[15] "Variable voltage circuitry" means that the voltage levels can be adjusted on the chip after manufacture; it does not encompass predetermined settings.

D. "tending to" claim limitations ('145 and '274 Patents)

Terms	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
"tending to"			
an electric field tending to repel the electrons from a portion of the body by the control terminal	'145: 1, 12	Not indefinite	Indefinite
an electric field in the body tending to cause electrons in the body to move in a direction from the first terminal to the second terminal	'274: 1, 11	Not indefinite	Indefinite

1. RE Secured Opening Position

OmniVision has incorrectly alleged that the term "tending to" is indefinite and cannot meet its burden to prove indefiniteness by "clear and convincing evidence." *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011).

[15] RE Secured wrongly attempts to create a dispute concerning the function of the "transfer transistor" in an image sensor pixel. RE Secured is flat wrong to argue that it "act[s] as an analog amplifier that amplifies the voltage across photodiodes." (Theuwissen Supp. Decl. at ¶¶ 30–36, JA 728–30; Reply Br., *supra* pp. 45–46.) Even its expert conspicuously omits any citation to evidence in support. (Carley Supp. Decl. at ¶ 41, JA 707–08.) RE Secured's position directly contradicts the intrinsic evidence confirming that the transfer transistor operates as a switch. (*See, e.g.,* Ans. Br., *supra* pp. 44–45 (citing Theuwissen Op. Decl. at ¶¶ 70–71, 108, 109 and Ex. 14, and '671 Pat. at 2:5-11, JA 653–54, JA 672, JA 1209, and JA 35); Theuwissen Supp. Decl. at ¶¶ 32–34, JA 729.)

As an initial matter, OmniVision has not provided any explanation in its invalidity contentions as to why this term is allegedly indefinite. Instead, OmniVision has only stated to RE Secured during the meet-and-confer process that OmniVision's position is that "tending to" is indefinite because there is allegedly no objective baseline as to location, magnitude, and direction.

While RE Secured reserves its right to respond in greater detail if OmniVision provides further clarity on why "tending to" is indefinite, OmniVision's apparent position is flawed for several reasons. First, as the Federal Circuit has held, "[m]erely claiming broadly does not render a claim insolubly ambiguous, nor does it prevent the public from understanding the scope of the patent." *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1352 (Fed. Cir. 2009) (internal citations omitted). Rather, "a patent claim is indefinite if, when 'read in light of the specification delineating the patent, and the prosecution history, [the claim] fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention.'" *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017) (quoting *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014)). Further, "'[r]easonable certainty' does not require 'absolute or mathematical precision.'" *Id.* (quoting *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1381 (Fed. Cir. 2015). Indeed, the Supreme Court warns that "absolute precision is unattainable," recognizing that "[s]ome modicum of uncertainty…is the price of ensuring the appropriate incentives for innovation." *Nautilus, Inc.*, 572 U.S. at 909 (internal citations omitted).

Here, as confirmed by Dr. Carley, a POSITA would understand the plain and ordinary meaning of the term "tending to." Carley Op. Decl. ¶¶ 72-78, JA 614-17. For example, Dr. Carley explains that a POSITA would be well aware of the idea that an electric field repels or causes electrons to exhibit average movement—it is a fundamental concept of electrical circuit design that electric fields can be used to move electrons from one region of a circuit to another. Carley

Op. Decl. ¶ 72, JA 614-15. As Dr. Carley opines, the primary means of pushing electrons is the generation of an electric field that repels electrons, attracts electrons, or generally causes the electrons to move in a certain direction. *Id.* Further, the term "tending to repel" has been used in numerous patents dating back to at least 1953. U.S. Patent No. 2,640,949, "Electron Source," at 4:37-48 (Carley Op. Decl., Ex. D, JA 771); U.S. Patent No. 3,175,105, "Conversion of Heat to Electricity," at 1:37-38 (Carley Op. Decl., Ex. E, JA 775); U.S. Patent No. 3,418,514, "Electrical discharge detectors for gas chromatography," at 5:4-5 (Carley Op. Decl., Ex. F, JA 781); U.S. Patent No. 3,478,242, "Cathode ray tube having image-forming elements in displaced, parallel planes," at 4:52 (Carley Op. Decl., Ex. G, JA 786). *See* Carley Op. Decl. ¶ 73 n. 30, JA 615. For example, in U.S. Patent No. 2,640,949, the inventors discussed an electrostatic force "tending to repel the electrons" to influence the electrons to move away from a particular region described in the invention. U.S. Patent No. 2,640,949, at 4:37-48 (Carley Op. Decl., Ex. D, JA 771); *see also* Carley Op. Decl. ¶ 73, JA 615. Further, the term "tending to cause" has been historically in patents dating back to at least 1941. U.S. Patent No. 3,246,191, "Neutron Generating Discharge Tube," at 2:12-15 (Carley Op. Decl., Ex. J, JA 811); U.S. Patent No. 2,239,677, "Method of Electron Control," at 5:20-21 (Carley Op. Decl., Ex. K, JA 831); U.S. Patent No. 2,447,630, "Method of Making Selenium Rectifiers," at 2:24-25 (Carley Op. Decl., Ex. L, JA 833). *See* Carley Op. Decl. ¶ 73 n. 31, JA 615.

Second, OmniVision's proposed construction that these claim terms are indefinite is unsupported by the intrinsic evidence. As Dr. Carley explains in his expert declaration, the '145 Patent specification provides clarity to the term "an electric field tending to repel the electrons," which is that a "terminal creates an electric field that repels electrons from the body by the control terminal." '145 Pat. at 2:27-29, JA 77; *see also* Carley Op. Decl. ¶ 72, JA 614-15. Further, the

'274 Patent specification provides clarity to the term "an electric field in the body tending to cause electrons…to move," which is that "[t]he control terminal creates an electric field in the body tending to cause electrons in the body to move in a direction from the first terminal to the second terminal." '274 Pat. at 2:21-24, JA 119; *see also* Carley Op. Decl. ¶ 72, JA 614-15. The '274 Patent specification explains that "[g]rading the work function of a transfer gate guides the electrons in the vicinity of the transfer gate in a direction from the photodetector area towards the transfer gate." '274 Pat. at 2:9-12, JA 119; *see also* Carley Op. Decl. ¶ 71, JA 614. The '274 Patent specification also describes that the "electric field from the P+ substrates concentration of boron helps to reflect photoelectrons towards the surface for collection by the photodiode." '274 Pat. at 8:25-28, JA 122; *see also* Carley Op. Decl. ¶ 71, JA 614.

Therefore, as Dr. Carley concludes, a POSITA would understand the meaning of "tending to repel electrons" to mean an electric field that repels electrons away from a particular location or region. Carley Op. Decl. ¶ 77, JA 617. Similarly, as Dr. Carley concludes, a POSITA would understand the meaning of "tending to cause electrons in the body to move in a direction" to mean an electric field that causes electrons to exhibit average movement in a particular direction. Carley Op. Decl. ¶ 78, JA 617. As such, OmniVision's proposed construction that these terms are indefinite should be rejected, and RE Secured's proposed constructions should be adopted.

2. OmniVision's Answering Position

Claims 1 and 12 of the '145 patent recite a "control terminal [that] creates an electric field tending to repel the electrons from a portion of the body by the control terminal." ('145 Pat. at 17:51-59, 18:65-19:5, JA 85.) Claims 1 and 11 of the '274 patent recite that the difference in two portions of a nonconstant work function in the control terminal "create[s] an electric field in the body tending to cause the electrons to move in a direction from the first terminal to the second terminal." ('274 Pat. at 17:67–18:3, 19:17-20, JA 127–28.) As recited in the claims, the

"electrons" at issue are those generated by the photodiodes when hit by photons of light. ('145 Pat. at 17:37-38, 18:50-51, JA 85; '274 Pat. at 17:38-39, 18:55-56, JA 127.)

Yet, both sets of claims focus on the portion of the transfer transistor that operates as the input to the proverbial switch that allows the electrons collected in the photodiode due to the absorption of the photons of light in the silicon (*i.e.*, the "generated electrons") to pass out of the photodiode to what is known as the "floating diffusion" node. (Theuwissen Op. Decl. at ¶ 120, JA 676; '145 Pat. at cls. 1 and 12 and 2:6-26, JA 85–86, JA 77 ; '274 Pat. at cls. 1 and 11 and 2:13-21, JA 127–28, JA 119.) The purported improvement the patentee attempted to claim in the '145 patent is to make the switch more default off, by pushing away electrons that may be present. (*See, e.g.*, '145 Pat. at cls. 1 and 12 and 13:46–14:36, JA 85–87, JA 83.) However, when the switch is open, the electrons that are pushed away would not be the "generated electrons;" rather, they would just be random free electrons in the semiconductor material. (Theuwissen Op. Decl. at ¶ 120, JA 676.) The purported improvement the patent attempted to claim in the '274 patent is to change the doping concentrations along the control terminal so that electrons will more easily move from the photodiode to the "floating diffusion" node. (*Id.* at ¶¶ 78, 79, JA 658–59; *see also* '274 Pat. at cls. 1 and 11 and 13:45–14:36, JA 127–28, 125.) In both patents, the use of "tending to" in claiming the purported improvements renders the asserted claims indefinite.

"Tending to cause" and "tending to repel" electrons are problematic phrases. (Theuwissen Op. Decl. at ¶¶ 114–26, JA 675–78.) As RE Secured's own expert acknowledges, electrons are always moving. (Carley Op. Decl. at ¶ 74, JA 615–16; *see also* Theuwissen Op. Decl. at ¶¶ 35, 119, JA 640, 676.) Indeed, of the numerous patents referenced by RE Secured (Op. Br., *supra* pp. 49–50), all but one ***avoid*** using the phrase "tending to" in the claims—likely because it does not meet the specificity requirement of the patent statute. *See* 35 U.S.C. § 112. Here, "tending to" does

not provide an objective baseline as to what electric field would be required, including as to the magnitude of the electric field, how far into the area beneath the control terminal it should reach, or laterally how far into the channel it should extend. (Theuwissen Op. Decl. at ¶¶ 115–21, JA 675–77.) And nothing RE Secured and its expert rely on, intrinsic or otherwise, provides a baseline. Because the term fails to provide a baseline to a skilled artisan when read in view of the specifications and prosecution histories, it is indefinite. *Liberty Ammunition v. United States*, 835 F.3d 1388, 1396 (Fed. Cir. 2016) ("[t]erms of degree are problematic if their baseline is unclear to those of ordinary skill in the art").

For example, "tending to" is similar to the term "reduced" (as in "reduced food effect"), which this Court assessed for indefiniteness in concluding that defendants raised a substantial question of invalidity in denying plaintiffs' motion for a preliminary injunction in *Astellas Pharma Inc. v. Lupin Ltd.*, 2024 WL 1832483 (D. Del. April 19, 2024), *report and recommendation adopted,* 2024 WL 1759149 (D. Del. April 24, 2024). Stating that "reduced" was a term of degree that "will fail for indefiniteness" absent "objective boundaries for those of skill in the art" in light of the intrinsic evidence, this Court concluded that: (1) there was no clear definition of the term in the specification, where multiple different possible definitions of "the effects by food are reduced" bolstered Defendants' indefiniteness argument; (2) plaintiffs' construction proposals were vague and confusing, led to more questions than answers, and even if adopted, would not "move the ball forward" on rendering the claims definite; and (3) to the extent a patent example arguably provided "a few data points" on the term, the patent did not indicate what the outer bounds of a qualifying reduction would be or otherwise clarify for a person of ordinary skill what the patent meant by "a reduced food effect." *See id.*

RE Secured's apparent proposed "plain and ordinary" interpretations (Op. Br., *supra* p. 49) are also confusing or improper and lead to more questions than answers. As an initial matter, any proposal by RE Secured that "tending to repel electrons" means "repels electrons" must be rejected for rendering the term "tending to" meaningless. *Integra Lifesciences Corp.,* 2017 WL 3731244, at *6 (citing cases).

Moreover, the foundation of RE Secured's proposed interpretations appears to be RE Secured's expert's proposal that one averages movement of electrons to subtract out the random motion inherent in the process: "'tending' requires averaging out the background thermal motions of the electrons and 'to repel' provides the necessary direction for the motion of the electron after averaging removes the thermal vibrations." (Carley Op. Decl. at ¶ 74, JA 615–16.) But that is nowhere in the claim, specification, or prosecution history. (Theuwissen Op. Decl. at ¶¶ 122–23, JA 677–78.) Indeed, RE Secured's proposal only serves to highlight the indefiniteness problem: What is the noise (unintentional random motion of electrons or variations in the control terminal as made) that is to be removed by averaging? What constitutes a *sufficient* electric field push (or pull) to satisfy the "tending to repel" requirement of the claim? And *where* does the field need to be located? As such, it is wholly unclear how a skilled artisan would ascertain when is infringing the asserted claims of the '145 and '274 patents and when is outside the scope. (*Id.* at ¶¶ 112–26, JA 674–78.)

To be clear, this is not merely a matter of terms of degree where some wiggle room is allowed. Here, "tending to" is indefinite because the claims, the specifications, and the prosecution histories provide no baseline floor upon which one is to determine how much electron movement (which one cannot directly see) is required to infringe or where to even look for such movement for purposes of infringement—where there is no dispute that electrons will always move.

Moreover, any change in doping concentrations within a semiconductor will create an electric field as a matter of semiconductor physics, and as such, any image sensor will have some electric fields inherent in them. (Theuwissen Op. Decl. at ¶ 40, JA 642.) The question remains as to what baseline difference from these inherent features is required by the asserted claims, rendering them indefinite.

3. RE Secured's Reply Position

OmniVision fails to show indefiniteness of the "tending to" claim terms, let alone by "clear and convincing evidence." *Microsoft Corp.*, 564 U.S. at 95. RE Secured demonstrated in its opening brief, including through the testimony of its expert, Dr. Carley, that the "tending to" claim terms provide sufficient clarity to a POSITA and thus no further construction is necessary. It is black letter law that a claim need not recite a strict numerical boundary to be valid, *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017) ("[A] patentee need not define his invention with mathematical precision . . . ."), and, as Dr. Carley explained, the term "tending to" is used in the art because it is a fundamental principle of electrical circuit design that not every single electron will move in the same direction, *e.g.*, "from the body" or "from a portion of the body." Instead, it is a basic concept in semiconductor design and in the industry that electric fields, such as those claimed here, will generally cause movement of electrons, ***but not all electrons***, and therefore a term like "tending to" is proper. Carley Op. Decl. ¶¶ 72-78, JA 614-17.

OmniVision's assertion, therefore, that the "tending to" terms provide no "objective baseline" (Ans. Br., *supra*, p. 53) is contrary to how a POSITA would understand the term. OmniVision alleges that the term would not indicate "what electric field would be required, including as to the magnitude of the electric field, how far into the area beneath the control terminal it should reach, or laterally how far into the channel it should extend." Ans. Br., *supra*, p. 53 (citing Theuwissen Op. Decl. ¶¶ 115-21, JA 675–77). OmniVision appears to be confusing an indefinite

claim term with a broad claim term. *See, e.g.*, *Ultimax* , 587 F.3d at 1352 ("Merely claiming broadly does not render a claim insolubly ambiguous, nor does it prevent the public from understanding the scope of the patent."); *BASF Corp.*, 875 F.3d at 1365 ("[A] patent claim is indefinite if, when read in light of the specification delineating the patent, and the prosecution history, [the claim] fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention," where "[r]easonable certainty does not require absolute or mathematical precision.") (internal citations omitted). In any event, OmniVision is technically incorrect—as Dr. Carley confirms, a POSITA would be well aware of the idea that an electric field generally repels or causes electrons to exhibit average movement. Carley Op. Decl. ¶ 72, JA 614-15. OmniVision's argument that Dr. Carley's proposal "that one averages movement of electrons to subtract out the random motion inherent in the process" "is nowhere in the claim, specification, or prosecution history" (Ans. Br., *supra*, p. 54) misses the point—this is a fundamental concept of electrical circuit design that electric fields can be used to move electrons from one region of a circuit to another and would thus be well known to a POSITA reading the claim. *See, e.g.*, Carley Op. Decl. ¶¶ 72-78, JA 614-17. No separate definition of the term is necessary for a POSITA. OmniVision's misunderstanding of the at-issue technology is also demonstrated by its expert's position that "[i]n the absence of a control voltage would mean 'floating,' *i.e.*, not having a connection." Theuwissen Op. Decl. ¶ 118, JA 676. As Dr. Carley explains, a POSITA would clearly understand that an unselected tg line is one that is in a low state, at a voltage of V_{low_tg} as shown in Fig. 11 of the '274 Patent, *not* that the control voltage is floating by virtue of not having a connection. Carley Suppl. Decl. ¶ 46, JA 645. In any event, OmniVision's extrinsic evidence cannot trump the actual language of the claim, or its plain and ordinary meaning to those of skill in the art.

Further, OmniVision's analogy of "tending to" to the term "reduced" is inapposite—the phrase "a reduced food effect" is not a term of art in the same way that "tending to" has historically been used as a known term of art in the electrical arts (as shown in the prior art) and generally as a fundamental concept of electrical circuit design of which a POSITA would be well aware.

Moreover, OmniVision's assertion that "all but one" of the patents cited in RE Secured's opening brief "avoid using the phrase 'tending to' in the claims—likely because it does not meet the specificity requirement of the patent statute" is speculative and baseless. Ans. Br., *supra*, p. 53. That all of the patents use the term confirms it is known and understood in the art, regardless of whether chosen to define the scope of any given claim. And that one of the patents cited ***did*** use the phrase "tending to" in its claims—which are presumed valid—further confirms the propriety of its use here as well.

As Dr. Carley explains, a POSITA would understand the meaning of "tending to repel electrons" to mean an electric field that repels electrons away from a particular location or region. Carley Op. Decl. ¶ 77, JA 617. A POSITA would also understand the meaning of "tending to cause electrons in the body to move in a direction" to mean an electric field that causes electrons to exhibit average movement in a particular direction. Carley Op. Decl. ¶ 78, JA 617. As such, OmniVision's indefiniteness position is without merit, and OmniVision has certainly not shown clear and convincing evidence of invalidity as would be required.

4. OmniVision's Sur-Reply Position

RE Secured itself demonstrates that the "tending to" claim limitations are indefinite, because RE Secured cannot offer any construction ***other than to read out*** "tending to" entirely from the claim. This is directly contrary to how claim construction is performed and serves to establish the indefiniteness of claims 1 and 12 of the '145 patent and claims 1 and 11 of the '274 patent. *See Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1355 (Fed. Cir. 2005),

abrogated on other grounds by Nautilus, Inc. v. Biosig Instruments, Inc., 572 U.S. 898 (2014) ("We would subvert the definiteness requirement if we allowed a word to be eliminated from a phrase when the phrase cannot be given a reasonable meaning except in the absence of that word."). This Court and others have held that a patent owner's attempt to read out the disputed claim language supports a holding that the claim is indefinite. *See Satius Holding, Inc. v. Samsung Elecs. Co.*, 2024 WL 5090284 (D. Del. Dec. 12, 2024) (Burke, M.J.) (rejecting plaintiff's proposed construction that would "read out" disputed portion of claim term and finding same term indefinite); *Jaguar Land Rover Ltd. v. Bentley Motors Ltd.*, 2020 WL 7010227 (E.D. Va. Oct. 14, 2020) (rejecting plaintiff's proposed construction that would read out the disputed term of degree and holding the term indefinite because the patent failed to provide "some standard for measuring that degree").

RE Secured also wrongly asserts that the issue is a matter of breadth. "Tending to" is a ***term of degree***. Yet, throughout the entire "tending to" section of its Reply Brief, RE Secured cites to a total of four cases for support, only ***one*** of which, *Sonix Tech.*, actually pertains to terms of degree. RE Secured cites that case for the proposition that an invention need not be defined with mathematical precision. (Reply Br., *supra* p. 55 (quoting *Sonix Tech. Co. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017)).) Even so, the court still required "an objective baseline through which to interpret the claims." *Sonix Tech.*, 844 F.3d at 1378; *see also Liberty Ammunition, Inc. v. United States*, 835 F.3d 1388, 1395–96 (Fed. Cir. 2016) ("Terms of degree are problematic if their baseline is unclear to those of ordinary skill in the art . . . [and] will fail for indefiniteness unless they provide objective boundaries . . . .") (internal quotations omitted); *see also GE Lighting Sols., LLC v. Lights of Am., Inc.*, 663 F. App'x 938, 940 (Fed. Cir. 2016) (requiring "objective boundaries" for a term of degree to be found definite). The issue is not

breadth, but indefiniteness. RE Secured fails to even attempt to provide any objective baseline for "tending to."

RE Secured alleges that "a fundamental concept of electrical circuit design [is] that electric fields can be used to move electrons from one region of a circuit to another." (Reply Br., *supra* p. 56.) But even if taken as true, this ***still*** fails to disclose an objective baseline. (Theuwissen Op. Decl. at ¶¶ 119–26, JA 676–78.)[16]

Because RE Secured's only solution is to read the term out completely, and because the intrinsic record is void of any guidance for determining an objective baseline as to what electric field would be required (*id.* at ¶¶ 115–21, JA 676–77), claims 1 and 12 of the '145 patent and claims 1 and 11 of the '274 patent, which include "tending to," are indefinite.

E. "a plurality of p-type regions having a concentration stronger than a background p-type concentration of the plurality of transfer devices" ('145 Patent)

Term	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
a plurality of p-type regions having a concentration stronger than a background p-type concentration of the plurality of transfer devices	'145: 1, 12	Plain and ordinary meaning, *i.e.,* a plurality of p-type regions having a concentration of p-type dopants higher than a background p-type concentration of the plurality of transfer devices	Indefinite

1. RE Secured's Opening Position

RE Secured proposes that the term "a plurality of p-type regions having a concentration . . ." should be given its plain and ordinary meaning. Dr. Carley explains in his declaration that a

[16] RE Secured's Reply references Dr. Theuwissen's Opening Declaration at ¶ 118, but ignores his analysis in the paragraphs cited here.

POSITA would understand this term as written, without need for explanation as the terms are foundational terms that any vendor, and even undergraduates in the field, would understand. Carley Op. Decl. ¶¶ 80-84, JA 618-21.

OmniVision apparently argues that the term is indefinite due to the inclusion of "background p-type concentration." But, as confirmed by Dr. Carley, the term "background p-type concentration" would be well-understood by a POSITA. Whenever a semiconductor is designed and fabricated, the starting point is the silicon substrate on which the circuit will be built and that silicon's background concentration and dopant. This fact would be well known to a POSITA because without it integrated circuits could not be designed and fabricated with any expectation that their chips would work on a reliable and repeatable basis. Carley Op. Decl. ¶ 82, JA 620. As Dr. Carley demonstrates with reference to one of the vendors where he purchases silicon substrates, the background concentration and dopant is a basic characteristic of all silicon substrates. Carley Op. Decl. ¶¶ 81-82, JA 619-20. Moreover, understanding background concentrations of silicon substrates and using that information to design integrated circuits is within the bailiwick of even undergraduates. As a result, a POSITA would be well versed in the meaning of the term "background p-type concentration." Carley Op. Decl. ¶¶ 80, 83-84, JA 618-21.

The intrinsic evidence explains the background concentration in the same way. '145 Pat. at 8:23-25, JA 80 ("An P epi layer of, for example, about 5E14 concentration with a thickness of 4 to 5 microns is optimal in one case"); *see also id*. at 6:18-58, JA 79 (detailed discussion of p-type concentrations in different portions of the invention), *id.* at 10:31-34, JA 81 (instructing POSITA on when to modify TDBI doping); *id.* at 11:20-31, JA 82 (describing where and how specific regions of the invention should be doped); *id*. at 11:32-12:4, JA 82 (describing

differences between p-well transistors and background concentrations); *id*. at 12:19-49, JA 82 ("[t]he pixel is formed in a <100> substrate 700 with a p-type doping of 5x1014 cm-3"); *id.* at 14:60-15:14, JA 83-84 (providing optimum doping concentration for background); *id*. at 15:15-19, JA 84 (describing concentration of epitaxial layer). Similarly, in Figures 14 and 33, a background concentration of 5e14 cm-3 is specified as one embodiment. And Figure 32 provides a gradient map showing concentrations and locations of doping that a POSITA would see and understand as providing unambiguous implementation.

As confirmed by the intrinsic record and Dr. Carley's explanation, the term is well understood, it is not indefinite, and it should be provided its plain and ordinary meaning.

2. OmniVision's Answering Position

The "background p-type concentration of the plurality of transfer devices" limitation is indefinite because it "fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). The claims do not provide objective guidance for identifying the claimed "background p-type concentration" limitation, and the intrinsic evidence fails to provide any clarity. Accordingly, claims 1 and 12 of the '145 patent are indefinite. *See Dow Chem. Co. v. Nova Chems. Corp.*, 803 F.3d 620, 634 (Fed. Cir. 2015) ("the existence of multiple methods leading to different results without guidance in the patent or the prosecution history as to which method should be used renders the claims indefinite").

Claims 1 and 12 do not explain what the "background p-type concentration of the plurality of transfer devices" is or how to determine it. (Theuwissen Op. Decl. at ¶¶ 130–31, JA 680.) The specification does not mention a "background p-type concentration of the plurality of transfer devices." The sole reference to a "background" doping concentration is in the context of the silicon wafer. (*See* '145 Pat. at 12:1-4, JA 82.) The Examiner rejected this language in a related patent

application as indefinite pursuant to 35 U.S.C. § 112 and stated that he would limit it to refer to the substrate. (*See* U.S. Patent App. No. 11/026,460 ("the '460 application"); *see generally* JA 232–389 (portions of '460 application file history, hereinafter "'460 File Hist."); *see also* '460 File Hist., Mar. 26, 2007 Non-Final Rejection at 2, JA 301.)[17] But the applicant rejected the interpretation and argued that the background concentration is not limited to the substrate concentration, but "may further read on other embodiments of a background concentration . . . such as a well, an epitaxial layer, and dopant implants generally." ('460 File Hist., Sep. 26, 2007 Applicant Response at 13, JA 328.). Thus, the prosecution history indicates that the term could refer to any of several regions. (Theuwissen Op. Decl. at ¶ 137, JA 681–82.)

Because the skilled artisan has "no informed and confident choice among the contending" locations that could be considered as "background," the claim is indefinite. *See HZNP Meds. LLC v. Actavis Labs UT Inc.*, 940 F.3d 680, 698 (Fed. Cir. 2019). The understanding of a POSA further confirms that the "background p-type concentration" limitation is indefinite. There are numerous structures with different doping concentrations that may be used within a pixel: the photodiodes, sources and drains, the gate, well implants, the channel under the gate, and the epi layer. (Theuwissen Op. Decl. at ¶ 133, JA 680–81.) And concentrations can vary within an individual region. (*Id.*) Moreover, further diffusion of dopants will preclude a bright line boundary. (*Id*. at ¶ 131, JA 680.) There is no established "background concentration" that leaves a skilled artisan to know which doping level should be chosen. (*Id.* at ¶ 136, JA 681.)

[17] "When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to subsequently issued patent that contain the same claim limitation." *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F 3d 973, 980 (Fed Cir 1999).

RE Secured itself confirms the lack of a clear choice for the skilled artisan, and the indefiniteness of the claim. ***First***, neither RE Secured nor Dr. Carley offer a construction for the court to even consider. (Theuwissen Op. Decl. at ¶ 139, JA 682.) ***Second***, to the extent that Dr. Carley's non-committal discussion is treated as a proposal that the background concentration is that of the substrate, his analysis is irrelevant. (*Id.*) Dr. Carley discusses his knowledge of "the silicon substrate upon which the circuit will be built" and his experience in selecting them. (Op. Br., *supra* p. 60; Carley Op. Decl. at ¶ 82, JA 620.) Indeed, Dr. Carley's insistence that even an undergraduate could figure out a doping level for a substrate wafer may be true, but it does not speak to how one would ***design*** the particular transfer transistor structures in a pixel, and neither does the rest of his opinion. (Theuwissen Op. Decl. at ¶ 139, JA 682.) ***Third***, the essential problem as established by the no-clear-choice jurisprudence for indefiniteness is confirmed by RE Secured's citations to the '145 patent itself: some of its citations are to epitaxial layer concentrations and others are references to the substrate—which are ***not*** the same. (*Id.* at ¶ 140, JA 682.)

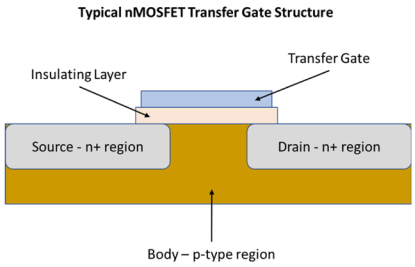
Claims 1 and 12 of the '145 patent are indefinite because the "background concentration" lacks an objective means by which to determine which region to consider and because there is no clear choice given to the skilled artisan.[18] (*Id.* at ¶¶ 129–41, JA 680–83.)

3. RE Secured's Reply Position

OmniVision argues that the term "background p-type concentration of the plurality of transfer devices" is indefinite because it fails to inform the scope of the invention. Ans. Br., *supra*,

[18] Notably, when the ITC was tasked with construing this same claim phrase, the Office of Unfair Import Investigations Staff also took the position that this phrase is indefinite. *See In the Matter of Certain Digital Imaging Devices and Products Containing the Same and Components Thereof*, Inv. No. 337-TA-1231, Doc. ID 735407, at 45 (Feb. 26, 2021), JA 1299.

pp. 62-64. But this argument ignores the intrinsic evidence and is contrary to how a POSITA would understand the term. A POSITA would understand a transfer gate's structure requires that it is fabricated in a body that has a known background concentration, the "body" in the diagram below. Carley Op. Decl. ¶¶ 80-84, JA 618-21. As such, a POSITA would have known the meaning of a background concentration in transfer devices. *Id*.



The intrinsic evidence also provides an explanation of background concentration such that a POSITA would understand the meaning in the context of the patent. '145 Pat. at 8:23-25, JA 80 ("An P epi layer of, for example, ***about 5E14 concentration*** with a thickness of 4 to 5 microns is optimal in one case" (emphasis added)); *see also id*. at 6:18-58, JA 79 (detailed discussion of p-type concentrations in different portions of the invention); *id.* at 10:31-34, JA 81 (instructing POSITA on when to modify TDBI doping); *id.* at 11:20-31, JA 82 (describing where and how specific regions of the invention should be doped); *id*. at 11:32-12:4, JA 82 (describing differences between p-well transistors and background concentrations); *id*. at 12:19-49, JA 82 ("The pixel is formed in a <100> substrate 700 with a p-type doping of 5x1014 cm-3"); *id.* at 14:60-15:14, JA 83-84 (providing optimum doping concentration for background); *id.* at 15:15-19, JA 84 (describing concentration of epitaxial layer). Similarly, in Figs. 14 and 33, a background concentration of 5e14 cm-3 is specified as one embodiment. '145 Pat. at Fig. 14, JA 61; *id.* at Fig. 33, JA 73.

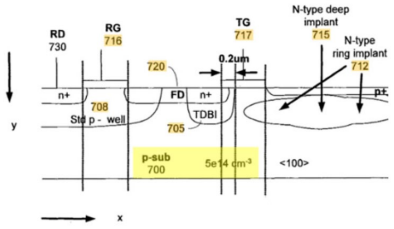


Fig. 14

Similarly, Fig. 32 provides a Net Doping gradient map showing concentrations and locations of doping that a POSITA would see and understand as providing unambiguous implementation. '145 Pat. at Fig. 32, JA 72.

OmniVision argues that, because the patent owner stated in the prosecution history of a different patent that "background concentration" "may further read on other embodiments of a background concentration . . . such as a well, an epitaxial layer, and dopant implants generally" (Ans. Br., *supra*, p. 63), this renders the term indefinite. OmniVision is mistaken for multiple reasons. First, it is telling that the applicant made this argument during the prosecution of U.S. Patent App. No. 11/026,460 ("the '460 application"), in response to an Examiner's indefiniteness rejection under Section 112. JA 328-29. After the applicant provided this definition of "background concentration," the Examiner dropped the indefiniteness argument, and the application later issued as U.S. Patent No. 7,755,116. *See* JA 331-52; JA 385-88. Second, at most, the applicant's statements confirm the breadth of the claim term. *See, e.g.*, *Ultimax*, 587 F.3d at 1352 ("Merely claiming broadly does not render a claim insolubly ambiguous, nor does it prevent the public from understanding the scope of the patent."). If the "body" in the above diagram was, for example, a well, in that context, a POSITA would know, in that scenario, the background concentration refers to the well, not the substrate. And, similarly, the "body" may also be an

epitaxial layer. A POSITA would readily understand how to determine if the claim term is met. Carley Suppl. Decl. ¶¶ 50-51, JA 710-11.

4. OmniVision's Sur-Reply Position

In response to OmniVision confirming that RE Secured again incorrectly addressed the technology at hand (by wrongly comingling "substrate" with "epitaxial layer"), RE Secured again raises a strawman. RE Secured's reproduction of Dr. Carley's generic and simplistic drawing not only sidesteps the intrinsic evidence concerning the image sensor pixel addressed in the MTTPs, but it also demonstrates that RE Secured is once again shadowboxing by arguing what "body" can encompass in this uncredited figure. (Carley Supp. Decl. at ¶ 50, JA 710; Reply Br., *supra* pp. 63–64.) "Body" is neither in the claim language at issue nor in any proposed construction offered by RE Secured.

Moreover, RE Secured's "body" argument is fatally flawed and its own figure demonstrates that there is "no informed and confident choice" among the contending locations that could be considered as "background" to avoid indefiniteness. *See HZNP Meds. LLC v. Actavis Labs UT Inc.,* 940 F.3d 680, 698 (Fed. Cir. 2019). Dr. Carley focuses on the "body" in his drawing while ignoring that the n+ source and drain regions in this drawing are also "doping implants" specifically listed as possible background locations by applicants in the prosecution history. (Theuwissen Supp. Decl. at ¶¶ 50–51, JA 734–35.) Dr. Carley establishes that RE Secured is incorrect: the lack of any informed and confident choice as to what is the "background concentration" is confirmed by his own drawing providing multiple equally possible locations—and the simplistic figure fails to consider that "wells" and "epitaxial layers" were also asserted to be possible alternative locations. (*Id.* at ¶¶ 50–52, JA 734–35.)

RE Secured can only point to examples in the specification where various doping levels are referenced. But this only harms its position as it cannot provide any definition itself as to what

"background concentration" could mean. Further, RE Secured is again wrong: the examiner never withdrew his indefiniteness rejection—he simply applied it only to the substrate. (*See* '460 File Hist. at Mar. 26, 2007 Office Action at 2, JA 301 (explaining rejection of claim 1 under § 112, and noting "[f]or the remainder of this Action, Examiner interprets the 'background concentration' as the substrate concentration").) Even now, RE Secured cannot provide any objective boundary to the Court and its suggestion that no boundary is necessary is untenable in the context of claim construction. *See, e.g. Reckitt Benckiser LLC v. Amneal Pharms. LLC,* 276 F. Supp. 3d 261, 282 (D.N.J. 2017), *aff'd,* 737 F. App'x 538 (Fed. Cir. 2018) ("A 'you'll know it when you see it' approach hardly meets the structural claim limitation.").

F. "control terminal having a non-constant work function" ('274 Patent)

Claim Language	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
control terminal having a non-constant work function	'274: 1, 11	Not indefinite	Indefinite

1. RE Secured's Opening Position

OmniVision has alleged that the term "non-constant work function" is indefinite. Although OmniVision has not actually briefed the issue or provided any explanation in its invalidity contentions, RE Secured generally understands from the meet-and-confer process that OmniVision's position is the term is indefinite because it may cover control terminals with "unintentional" non-constant work functions (presumably as compared to a control terminal that is deliberately or intentionally designed to have a non-constant work function).

OmniVision's position is flawed for several reasons. First, OmniVision seems to be confusing indefiniteness with breadth. As the Federal Circuit has consistently reminded, a broad claim is **not indefinite** merely because it encompasses a wide scope of subject matter provided the

scope is clearly defined. *See BASF Corp.*, 875 F.3d at 1365-67 ("[B]readth is not indefiniteness.") (internal citations omitted). Further, OmniVision has again failed to meet its burden to prove indefiniteness by clear and convincing evidence. *Microsoft Corp.*, 564 U.S. at 95.

In any event, notwithstanding the specification, the remainder of the claim also resolves the issue because it confirms that the nonconstant work function "create[s] an electric field in the body tending to cause electrons in the body to move in a direction from the first terminal to the second terminal." '274 Pat. at 17:67-18:3 (cl. 1), JA 127; *see also Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1349 (Fed. Cir. 2022) ("As with any question of claim construction, the intrinsic record—the patent's claims, written description, and prosecution history—along with any relevant extrinsic evidence can provide or help identify the necessary objective boundaries for claim scope."). In other words, it is not the case that any incidental non-constant work function necessarily meets the claim. Instead, the work function must be non-constant in such a way that it would cause electron movement in a specific direction. As discussed above, the "tending to" language is not indefinite either and provides to a POSITA reasonable understanding of scope. And it similarly informs a POSITA as to whether this term is met—the work function must be non-constant in such a way that it causes this electron movement.

The meaning of non-constant work function is also explained in the specification of the '274 Patent in a manner consistent with its plain meaning. *See, e.g.*, '274 Pat. at 14:14-17, JA 125 (the "work function of the gate can also be sloped to be non-constant with the work function over the n-type area being more p-type than the work function over/near the sense node").

The '274 Patent specification then goes on to discuss graded work functions: "[g]rading the work function of a transfer gate guides the electrons in the vicinity of the transfer gate in a direction from the photodetector area towards the transfer gate." '274 Pat. at 2:9-12, JA 119. The

"transfer gates…control a transfer of the electrons between a photodetector and a corresponding floating diffusion." *Id.* at 2:15-17, JA 119. The specification further explains that the "work function of the gate can also be sloped to be non-constant with the work function over the n-type area being more p-type than the work function over/near the sense node." *Id.* at 14:14-17, JA 125. "[B]y using a polycrystalline silicon gate with a more p-type work function" the barrier of the transfer gate is optimized, "resulting in improved properties." *Id.* at 13:47-49, JA 125.

Based on the plain language of the claim and this other intrinsic evidence, Dr. Carley has confirmed that the term is not indefinite and would be well understood by a POSITA. Carley Op. Decl. ¶ 88, JA 622. OmniVision's indefiniteness position should be rejected.

2. OmniVision's Answering Position

It is unclear what position RE Secured is willing to take given its non-committal language concerning whether "non-constant" entails a designed change in the work function or rather manufacturing imperfections. (*See*, *e.g.*, Op. Br., *supra* p. 68 ("it is not the case that any incidental non-constant work function necessarily meets the claim").) However, if RE Secured is willing to adopt its own expert's position that non-constant means that the work function for the control terminal has a "sloped" design, OmniVision is amenable to a stipulation to this effect.[19]

3. RE Secured's Reply Position

OmniVision has apparently abandoned its position that this term is indefinite. It is *OmniVision's* burden—by clear and convincing evidence—to show why the term renders the patent invalid. *Microsoft Corp.*, 564 U.S. at 95. In its answering brief, OmniVision offers no support for its position and does not present a *prima facie* case for indefiniteness. And despite not

[19] OmniVision sought to meet and confer regarding this and other issues prior to the filing of this brief to try to reach a stipulation, but RE Secured refused. (*See* Email from K. Lynch to A. Sewanan (Apr. 11, 2025), JA 1225–26.)

having the burden to prove validity, RE Secured explained in detail and with the support of an expert why the term was definite in its opening brief. Op. Br., *supra*, pp. 68-69. Because OmniVision has offered no evidence or argument to support its alleged indefiniteness position, but instead has apparently abandoned it, RE Secured respectfully asks the Court to not find the term indefinite.

In its answering brief, OmniVision for the first time provides the possibility that it would be amendable to an alternative construction for the term referring to a "sloped" design and cites to Dr. Carley's declaration. However, as Dr. Carley has confirmed, that passage from his declaration was not meant to restrict the term "non-constant work function" to ***only*** a sloped design, but this is certain an example of a non-constant work function. Carley Suppl. Decl. ¶ 54, JA 711. Indeed, in the same discussion, Dr. Carley explained how the term refers to a work function that is non-constant along the channel of the MOSFET in such a way that it would cause electron movement in a specific direction. Carley Op. Decl. ¶ 87, JA 621-22. This is consistent with the specification, which is permissive, noting that the work function "***can*** also be sloped" to be non-constant, but not requiring this. '274 Pat. at 14:14-17, JA 125. As RE Secured explained in its opening brief, this term need not be construed and, because OmniVision offers no argument to support its indefiniteness position or to rebut RE Secured's position, RE Secured respectfully requests that the Court find the term not indefinite.

4. OmniVision Sur-Reply Position

Dr. Carley originally opined that a POSITA would understand that a "'non-constant work function' is a work function that is ***sloped***[.]" (Carley Op. Decl. at ¶ 88, JA 622.) RE Secured now walks back its own expert's opinion in an apparent effort to improperly avoid resolution, refusing to acknowledge that the parties could agree to the definition of "non-constant" as "sloped." *See, e.g., NuVasive, Inc. v. Globus Med., Inc.*, 2013 WL 3705731, at *4 (D. Del. July 12, 2013)

("Fundamentally, NuVasive had an obligation to assist the Court in resolving the parties' claim construction disputes."). It is antithetical to the claim construction process to suggest a definition and then claw it back when the opposing party agrees. *See, e.g., Gammino v. Sprint Commc'ns Co., L.P.*, 577 F. App'x 982, 990 (Fed. Cir. 2014) (affirming denial of motion to amend proposed claim construction where the court had "adopt[ed] the construction initially proposed by both parties"); *Tr. of Antonious v. Nike, Inc.,* 2016 WL 7426585, *7 (D.N.J. Dec. 9, 2016) (refusing to allow party to "press the 'reset' button" by "tak[ing] back a claim construction" after other party agreed).

RE Secured's vacillation confirms that this term is inherently indefinite. (*See* Ans. Br., *supra* p. 69.) OmniVision acquiesced to RE Secured's definition, which RE Secured now tries to revoke without providing an alternative. If "non-constant work function" cannot be defined as "sloped," then it is indefinite.

G. "Color interpolation circuit" / "combining the first, second, third, and fourth signals" ('651 Patent)

Terms	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
Color interpolation circuit / combining the first, second, third, and fourth digital signals			
a color interpolation circuit for combining the first, second, third, and fourth digital signals	'651:1	Plain and ordinary meaning, *i.e.*, a color interpolation circuit for combining the first, second, third, and fourth digital signals (where not all four digital signals necessarily need to be combined for each pixel)	Plain and ordinary meaning, which is hardware that combines the first, second, third, and fourth digital signals to provide an interpolated color value

Terms	Claims	RE Secured's Proposed Construction	OmniVision's Proposed Construction
combining the first, second, third, and fourth digital signals using a color interpolation circuit	'651:18	Plain and ordinary meaning, *i.e.*, combining the first, second, third, and fourth digital signals (where not all four digital signals necessarily need to be combined for each pixel)	Plain and ordinary meaning, which combining the first, second, third, and fourth digital signals to provide an interpolated color value

1. RE Secured's Opening Position

The term "color interpolation circuit" appears in the '651 Patent in claim 1 and an analogous step of "combining" appears in claim 18. There are two primary disputes regarding these terms. First, whether the term "circuit" is limited to only hardware (OmniVision's proposal) or whether a circuit can comprise both hardware and software (RE Secured's position).[20] Second, whether all four digital signals need to be combined to provide an interpolated color value (OmniVision's proposal) or whether the term requires combining the first, second, third, and fourth digital signals (not generating an interpolated color value) (RE Secured's position).

Regarding the first dispute, the term "circuit" has been repeatedly defined by other courts to not be limited to hardware. *See, e.g.*, *Diagnostic Grp., LLC v. Benson Med. Instruments Co.*, 2005 WL 715935, at *12 (D. Minn. March 28, 2005) ("[T]he ordinary meaning of 'logic circuit' is 'the software and/or hardware used for performing a specified function.'"); *Quantum World Corp. v. Atmel Corp.*, 2009 WL 241731, at *8 (E.D. Tex. Jan. 30, 2009) (defining circuit as "software, firmware, and/or hardware"); *Parthenon Unified Memory Architecture, LLC v. HTC Corp.*, 2015 WL 4594583, at *21 (E.D. Tex. July 30, 2015) (recognizing that ordinary meaning of circuit includes both hardware and software).

[20] This issue is only germane to claim 1 of the '651 Patent, not method claim 18.

The intrinsic record supports a similar finding here. For example, the specification identifies "color interpolation circuit 120" as an example of a component that "performs the interpolation for each pixel 102 to determine the color of the pixel 102." '651 Pat. at 5:23-27, JA 137. There is no disclosure in the specification that limits a "circuit" to hardware only, and the extrinsic record similarly confirms that performing interpolation as described in the patent can be performed by a combination of hardware and software. For example, the article by J. Adams, K. Parulski and K. Spaulding, "Color processing in digital cameras," *IEEE Micro*, vol. 18, no. 6, pp. 20-30, Nov.–Dec. 1998, discusses a variety of methods and inputs used by digital cameras for color interpolation. *Id.* (Carley Op. Decl., Ex. I, JA 792-803).

The second issue is whether the term requires that ***all four*** of the digital signals need to be combined to provide an ***interpolated color value***, as OmniVision proposes. OmniVision's proposed construction is incorrect because it ignores the plain language of the claims and improperly includes additional requirements that are not in the claims nor in the specification. In fact, "interpolated color value" is not mentioned anywhere in the claims nor in the specification. RE Secured's plain-meaning construction, in contrast, is consistent with the plain language of the claims, *i.e.*, that digital signals are ***combined***. As the claims make clear, the output of the red pixel is converted into a first digital signal, the output of the blue pixel is converted into a second digital signal, the output of the first green pixel is converted into a third digital signal, and the output of the second green pixel is converted into a fourth digital signal. '651 Pat. at 8:2-19 (cl. 1), JA 138; *id.* at 10:44-57 (cl. 18), JA 139.

The specification, as confirmed by Dr. Carley, supports RE Secured's position and the claim, disclosing an embodiment of color interpolation, where the process of color interpolation determines an unknown color data of a pixel using only certain outputs of neighboring pixels where

the corresponding color is known: "[t]his process averages the color outputs of appropriate neighboring pixels to approximate each pixel's unknown color data." *Id.* at 5:14-16, JA 137; Carley Op. Decl. ¶ 92, JA 624. For example, the specification describes that "for any given blue pixel 108, the process color interpolation determines the green content of the pixel 108 by averaging the outputs of the green pixels 110, 112 above, below, to the left and to the right of the pixel 108." Similarly, the specification describes that "the red content of the pixel 108 is determined by averaging the outputs of the red pixels 106 diagonally adjacent to the pixel 108." *Id.* at 5:21-23, JA 137. The specification does not state that ***all four*** digital signals are combined to provide an interpolated color value, as OmniVision proposes. Instead, the specification states the opposite—that only the respective same types of pixel data (*e.g.*, blue pixels, red pixels, green pixels) are combined. If OmniVision's proposed construction were to be adopted, it would be inconsistent with the disclosure in the specification.

Because OmniVision's construction includes additional requirements that are simply not in the claims and that are contrary to the specification, it is incorrect and should be rejected in favor of RE Secured's plain meaning interpretation of the claims.

2. OmniVision's Answering Position

The meaning of "color interpolation circuit for combining the first, second, third and fourth digital signals" in apparatus claim 1 and "combining the first, second, third and fourth digitals using a color interpolation circuit" in method claim 18 is readily apparent: all four digital signals are combined by a circuit. (*See* Theuwissen Op. Decl. at ¶¶ 142–56, JA 683–87.) There is no basis for RE Secured's "not necessarily" exception, and in the context of the claim language, it would not make sense to address interpolation other than being performed for ***each*** pixel. Furthermore, despite RE Secured's insistence that the claims cover both hardware *and software*, there no

mention of anything software-related in the claims or the rest of the '651 patent specification. RE Secured's effort at redrafting the claims to broaden their scope should be rejected.

Where the claim language is unambiguous, the plain meaning stands. *See, e.g., Spectrum Pharms., Inc. v. InnoPharma, Inc.*, 2014 WL 3365684, at *9 (D. Del. July 3, 2014), *report and recommendation adopted*, 2014 WL 4247182 (D. Del. Aug. 26, 2014); *see also Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). Here, combining all four digital signals is unequivocal. The claim does not recite "two of the four signals," "some of," or "selected from the group of": it says clearly, "combining a first, second, third, ***and*** fourth digital signals."

Interpolation is used to "determine the amount of red, green, and blue light incident on each pixel" because each pixel only receives one of three colors: red, green, or blue. ('651 Pat. at 4:34-37, 5:13-24, JA 136–37; *see also* Theuwissen Op. Decl. at ¶¶ 65–67, JA 652–53.) The missing values are estimated based on nearby pixels. ('651 Pat. at 5:14-16, JA 137.) Combining the four digital signals is consistent with the standard Bayer filter arrangement, shown in Figures 1–3, which employs four pixels in a repeating square pattern. Two pixels absorb green light, a third pixel absorbs red light, and the fourth absorbs blue light. The claims recite that the digital signals correspond to these four colors. ('651 Pat. at 8:2-19 (cl. 1), 9:28-34 (cl. 11), JA 138–39.)

There are numerous ways of performing interpolation that were well-known, such as simply picking a closest neighbor for each color. (Theuwissen Op. Decl. at ¶ 152, JA 686.) Indeed, the claims are not limited to any one specific method. But the interpolation claimed must combine all four digital signals.

RE Secured misunderstands what interpolation is in presenting its discussion of the specification. (Op. Br., *supra* p. 73). At its most basic, interpolation is a method of determining a

color value (i.e., the specific color output) for a pixel, based on varying the levels of the red, green, and blue colors that output from the pixel. (Theuwissen Op. Decl. at ¶¶ 66, 150–53, JA 652, JA 686–87.) The red, green, and blue values can be based on a number of factors, including adjacent pixels. The specification provides an example wherein a blue pixel uses its measured value, the average value of four adjacent green pixels, and the average value of four diagonally adjacent red pixels. ('651 Pat. at 5:16-25, JA 137.) As applied to the claims, the example addresses combining 4 first digital signals (red), 1 second digital signal (blue), 2 third digital signals (green), and 2 fourth digital signals (green), which RE Secured states thus meets the required "combining" of all four digital signals. But in asserting that only the same types of pixel data are combined, RE Secured mistakes the ***averaging*** of multiple signals with the act of ***combining***. (Theuwissen Op. Decl. at ¶ 154, JA 687.) Combining the signals serves to bring together a color value with all three colors (because a color value requires a value for red, green, blue, and each pixel only measures one color), thus performing the interpolation, which must use the four digital signals. The averaging of the four first digital signals, for example, is an additional step that is not required by the claim. Additional techniques such as averaging or noise are not at issue in the claims.

The specified mechanism by which the interpolation is to be performed ***as required by the claim*** is a "circuit." (*See, e.g.,* '651 Pat. at 8:18-19 (cl. 1), JA 140 ("a color interpolation ***circuit for combining*** the first, second, third and fourth digital signals.").) A skilled artisan in image sensing as of 2002 would understand that a "circuit," per its plain meaning, is hardware. (Theuwissen Op. Decl. at ¶ 146, JA 683–84 (referencing Theuwissen Exs. 9, 14 and 15 (dictionary definitions of "circuit"); *id.* at ¶¶ 147–49, JA 685–86.) Indeed, in electrical engineering applications, Courts have repeatedly held that a circuit connotes physical electrical components. *See, e.g., InterDigital Commc'ns, Inc. v. ZTE Corp.*, No. 1:13-CV-00009-RGA, 2014 WL

12798744, *1 (D. Del. Oct. 23, 2014), *aff'd*, 711 F. App'x 998 (Fed. Cir. 2017) (construing "circuit" as "arrangement of electrical ***components***"); *see also Silicon Graphics, Inc. v. ATI Techs., Inc*., No. 06-C-611-C, 2007 WL 5614112, *13 (W.D. Wis. Oct. 15, 2007), *aff'd in part, rev'd in part on other grounds*, 607 F.3d 784 (Fed. Cir. 2010) (construing "circuit" as "an interconnection of electrical ***hardware***").[21] Moreover, there is no discussion of software anywhere in the '651 patent specification.

RE Secured again wrongly skips an analysis of the plain and ordinary meaning of the claim terms to a skilled artisan as of the relevant time period and instead asks the Court to consider what else the '651 patent ***could have*** claimed based on expert opinion provided three years ***after*** the '651 patent expired. *See, e.g., Phillips*, 415 F.3d at 1318 ("[E]xpert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence."). Irrespective of whether the claims could have been drafted to perform interpolation by software, that is simply not what was claimed. The plain meaning of the claim language governs, not RE Secured's attempt at redrafting it.

3. RE Secured's Reply Position

There are two disputes regarding this term. The first is whether "circuit" must be limited to hardware only (OmniVision's proposal) or if it could include both software and hardware (RE Secured's proposal).

[21] RE Secured's citations to *Diagnostic Grp., LLC v. Benson Med. Instruments Co.*, 2005 WL 715935 (D. Minn. March 28, 2005), *Quantum World Corp. v. Atmel Corp.*, 2009 WL 241731 (E.D. Tex. Jan. 30, 2009), and *Parthenon United Memory Architecture, LLC v. HTC Corp.,* 2015 WL 4594583 (E.D. Tex. July 30, 2015) are all inapposite because the patent claims in those cases recited specific computer elements, such as a processor, and were not related to image sensors. These cases are not probative of the understanding of a skilled artisan or the claims at issue in this case.

As to the first issue, as RE Secured explained in its opening brief, its position is well-supported in other court's claim constructions. *See* Op. Br., *supra*, pp. 68-69 (citing *Diagnostic Grp.*, 2005 WL 715935, at *12; *Quantum World Corp.*, 2009 WL 241731, at *8; *Parthenon Unified Memory Architecture, LLC*, 2015 WL 4594583, at *21). OmniVision attempts to distinguish these cases by alleging they involved the use of a "processor." But there is no evidence that a color interpolation circuit could not be implemented by a processor. And indeed, the specification describes color interpolation as a "process." '651 Pat. at 5:13-20, JA 137. Moreover, OmniVision and its expert agree that in the art, "[t]here are ***numerous ways*** of performing interpolation that were well-known . . . ." Ans. Br., *supra*, p. 76. Neither OmniVision nor its expert take the position that interpolation must be performed in hardware or that a POSITA would understand that the *process* of performing interpolation as described in the '651 Patent must be done by hardware alone. Dr. Carley also confirms that the color interpolation circuit "is a means of executing instructions whether encoded in hardware, firmware, or software." Carley Op. Decl. ¶ 91, JA 623. OmniVision's overly-narrow construction should thus be rejected.

OmniVision cites to *InterDigital Commc'ns*, No. 13-009-RGA, 2014 WL 12798744, at *1 and *Silicon Graphics*, No. 06-C-611-C, 2007 WL 5614112, at *13 to argue that circuit should be hardware. However, neither case supports OmniVision's position. In *Interdigital*, the court construed "circuit" as an "arrangement of electrical components," without explanation and without any determination as to whether "circuit" should or should not encompass software. No. 13-009-RGA, 2014 WL 12798744, at *1. And in *Silicon Graphics*, the Wisconsin court made clear that its construction of "circuit" was context dependent ("any circuit described in this context . . . ."). No. 06-C-611-C, 2007 WL 5614112, at *13 . As described above, in the context of the '651 Patent, a circuit need not be limited to hardware.

The second issue is whether the four digital signals have to be combined for ***each*** pixel (OmniVision's construction) or whether this is unnecessarily narrow. Ans. Br., *supra*, p. 75 ("There is no basis for RESN's 'not necessarily' exception, and in the context of the claim language, it would not make sense to address interpolation other than being performed for ***each*** pixel.") (OmniVision's emphasis).

OmniVision's proposal—as confirmed by their answering brief—is unduly narrow. First, the claim language itself does not require that each of the four signals be combined for ***each*** pixel in a device. Carley Op. Decl. ¶ 93, JA 624. Instead, the claim is an open-ended comprising claim. *See* '651 Pat. at 8:2-19 (cl. 1), JA 138. It is black-letter law that a comprising claim allows for other components as well. *See, e.g.*, *Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1375-76 (Fed. Cir. 2004). And the limitations of the claim comprise *a* red pixel, *a* blue pixel, and *two* green pixels. The claim is not written in a way that would force ***each*** and every one of the potentially millions of pixels in a device to be generated in the same way. For this reason alone, OmniVision's construction is incorrect.

OmniVision's construction is also contrary to the specification. As OmniVision readily admits in its brief, and as disclosed in the '651 Patent's specification, there are many ways to perform interpolation. Ans. Br., *supra*, p. 76 ("There are numerous ways of performing interpolation that were well-known, such as simply picking a closest neighbor for each color . . . . The red, green, and blue values can be based on a number of factors, including adjacent pixels."). It would therefore be inconsistent with the claim language and the specification, reading out embodiments, to require each and every pixel in a device to have pixel values that are all generated by combining four digital signals the exact same way. And finally, both experts agree that the term

"interpolation" is broad. Carley Op. Decl. ¶¶ 92-93, JA 624; Theuwissen Op. Decl. ¶ 152, JA 686. OmniVision's overly-narrow construction should be rejected.

4. OmniVision's Sur-Reply Position

RE Secured's reply entirely misses the mark. "Processor" was recited in the claims for the cases it cites. That claim language is not present here, and it does not matter what other ways the claims ***could have been*** recited. What matters is that "circuit" is what is recited, that the uncontroverted plain meaning does not include "software," and that there is no mention of "processor" anywhere.

Similarly, RE Secured is misguided as to how "comprising" claims work. RE Secured gets to assert that additional elements can be present, so long as the explicitly recited language is included. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 499 (Fed. Cir. 1997) ("comprising" term "allows additional elements to be present ***as long as*** the named elements are present"). The patent owner is not entitled to ignore expressly recited claim language. Indeed, there could be a variety of ways that color interpolation circuits could be formed for multiple pixels. But there must be at least some color interpolation circuit that will employ ***all four*** signals to provide a color value for a pixel.

IV. CONCLUSION

1. RE Secured's Position

RE Secured respectfully requests that the Court adopt the constructions proposed by RE Secured, which are consistent with the intrinsic record and the plain meaning of the claim terms, as set forth herein.

2. OmniVision's Position

OmniVision respectfully requests that the Court adopts the constructions proposed by OmniVision, supported by the intrinsic evidence, as set forth herein.

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